6400-D Generation II Series Line Matrix Printers

Setup Guide

Form Number S550-0376-00

IBM 6400-D Generation II Line Matrix Printers

Setup Guide

Note!

Before using this information and the product it supports, read the information in “Notices” on page 159.

First Edition (January 2004)

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1 *Introduction*

About This Setup Guide

This *Setup Guide* is designed so that you can quickly install and configure your IBM* 6400-D Generation II Series printer.

Notes And Notices

For your safety and to protect valuable equipment, it is very important that you read and comply with the notes and notices included in this manual. Danger and Caution notices are numbered. These numbers enable you to find translated versions of these notices in the *IBM 6400 Line Matrix Printer Safety Information* booklet. Descriptions for each type of notice follow:

DANGER:

<#>	The word Danger indicates the presence of a hazard that has the potential of causing death or serious personal injury.

CAUTION:

<#> The word Caution indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.

CAUTION:

<#> This symbol indicates a heavy assembly that requires two or more persons to lift or hold.

ATTENTION

An attention notice indicates the possibility of damage to a program, device, system, or data.

IMPORTANT

Important draws your attention to information vital to proper operation of the printer.

NOTE: A note gives you helpful tips about printer operation.

Format Conventions

Key names, indicator names, and messages that appear on the operator panel display are capitalized as they actually appear on the printer. Key names are shown in **bold**. For example:

Press the **Start** key. The Attention indicator will light.

Related Documents

For more information about your printer, refer to the following documents:

- *IBM 6400-D Series Line Matrix Printer Operator's Guide* — Includes step-by-step instructions on daily printer operations.
- *IBM 6400 Line Matrix Printer Safety Information* — Provides translated safety notices.
- *IBM 6400 Line Matrix Printer Maintenance Information Manual* — Explains how to maintain and repair the 6400 line matrix printer at the field service level of maintenance. This manual covers alignments and adjustments, preventive and corrective maintenance, troubleshooting, and basic principles of operation.
- *IBM 6400-D Generation II Series LQ-1600K Programmer's Reference Manual* — Provides descriptions of LQ-1600K printer codes and character sets.
- *IBM 6400-D Generation II Series KS Programmer's Reference Manual* — Provides descriptions of KS printer codes and character codes.
- *IBM 6400-D Generation II Series KSSM Programmer's Reference Manual* — Provides descriptions of KSSM printer codes and character codes.

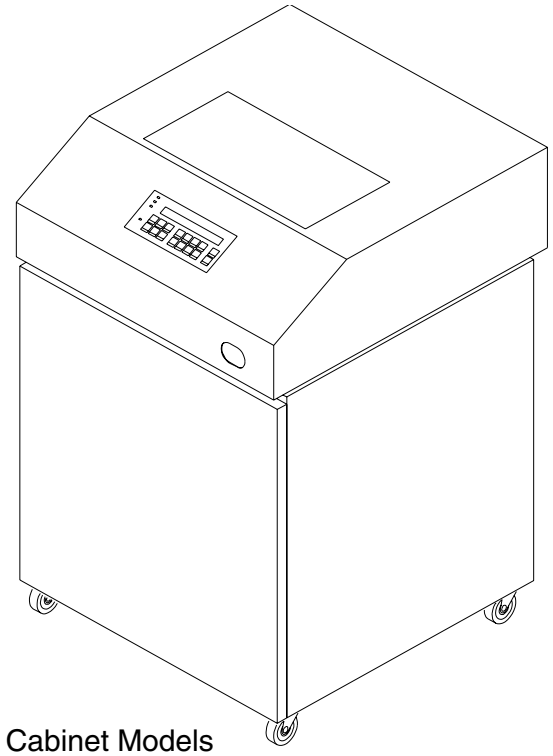
The IBM 6400-D Generation II Series Printer

The IBM 6400-D Generation II Series printers offer software versatility and the latest refinements in line matrix printing technology.

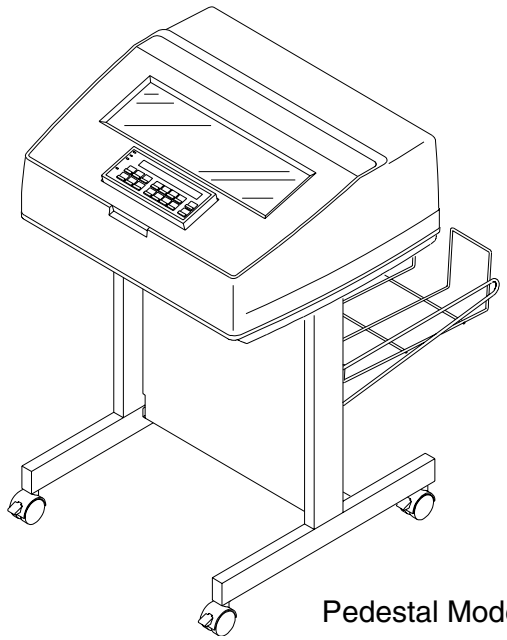
Either LQ-1600K, KS, or KSSM will be the standard emulation. To load all of the configuration parameters (forms length, line spacing, etc.), simply power on the printer.

You can easily switch to any set of configuration parameters by using the recall custom set feature from the operator panel. You can also switch emulations by using the operator panel keys.

Your printer is very easy to use. The message display and lights on the operator panel communicate information clearly and directly. You can select every function on your printer at the operator panel or you can send commands from the host computer.



Cabinet Models



Pedestal Models

Figure 1. The IBM 6400-D Generation II Series Line Matrix Printer

Standard Capabilities

The 6400-D Generation II Series has the following general characteristics:

- A broad range of print speeds in both cabinet and pedestal models
- Supports similar features across the entire product line to allow maximum flexibility in matching the printer to the requirements
- ENERGY STAR** COMPLIANT

The following sections summarize the standard capabilities of the IBM 6400-D Generation II Series printer.

Host Computer Interfaces

The following host computer interface choices are available:

RS-232 Serial

RS-422 Serial

PC Parallel

IEEE** 1284

Printer Emulations

Each configuration provides a different set of configuration menus, control codes, and character sets. The LQ-1600K printer emulation is standard for the IBM Hanzi printer, and the KS or KSSM printer emulation is standard for the IBM Hangul printer.

LQ-1600K Emulation

The LQ-1600K Emulation is used for the printing of Hanzi characters and supports the GB18030-2000 CAT-A character set.

KS and KSSM Emulation

The KS and KSSM Emulation is used for the printing of Hangul characters and supports the KSC5601 character set.

Output Control

The printers have the following output control features:

- LQ
- Near LQ
- Normal
- Hi-Speed
- Super Hi-Speed
- Ultra Hi-Speed
- Selectable pitch: normal, expanded, and compressed

- Emphasized (shadow) printing
- Automatic underlining and overscoring
- Superscript and subscript printing
- Double high and wide printing
- Resident multinational character sets

Graphics and Vertical Formatting

Several graphics and vertical formatting features are available:

- Built-in graphics generators providing a variety of graphic density for printing
- Epson LQ dot graphics mode
- Programmable electronic vertical formatting provides rapid vertical paper movement to specified lines for printing repetitive and continuous forms

Built-in Diagnostic Tools

The following diagnostic tools are provided with the printer:

- Comprehensive diagnostic self-tests permanently stored in the printer
- Configuration printout
- Data stream hex code printout

Optional Feature

The Input Paper Shelf feature can be ordered and installed on pedestal model printers. The Input Paper Shelf provides a shelf to hold a box of paper or forms. This is a convenient feature if you need to move the printer often.

If you ordered a feature at the time of purchase, the feature may already be installed on your printer. Refer to the documentation shipped with the feature for more details.

For detailed information about these features or for information on ordering a feature, contact your IBM sales representative or IBM Authorized Remarketeer.

Protocols And Emulations

A protocol is a set of rules governing the exchange of information between the printer and host computer. These rules consist of codes that manipulate and print data and allow for machine-to-machine communication. A printer and host computer must use the same protocol. As used in this manual, protocol and emulation mean the same thing.

2 *Setting Up The Printer*

Installation, Attachment, And Configuration Overview

DANGER:

<4>	**Do not connect or disconnect any communication port, teleport, attachment connector, or power cord during an electrical storm.**
<5>	**Power off the printer and disconnect the power cord before connecting or disconnecting any communication port, teleport, or attachment cable connector.**

The following is an overview of the steps you need to complete to successfully install, attach, and configure your printer:

1. Unpack the printer from the shipping package. Follow the instructions provided on the shipping package.
2. Set up the printer, which includes: removing shipping materials, installing a ribbon, and loading paper. Follow the instructions in this chapter.
3. Perform an initial print test by printing the current configuration page as described in Chapter 3, “Configuring the Printer.”
4. Review the information contained in the README.1ST file on the Configuration Utility diskette.

NOTE: The Configuration Utility diskette contains a README.1ST file that describes the contents of the diskette, AIX print drivers, and configuration information for replacing existing Printronix printers. In addition, there might be another file, called README.TXT that contains information that was added after the printer documentation was printed.

5. Attach the printer to the host system and configure the host system to work with the printer.

NOTE: If you are attaching this printer to an AIX host system, use the AIX Version 3.2.5 and 4.1 print drivers provided on the Configuration Utility diskette.

6. If you have not already ordered a communications cable, see page 153.

7. Configure the printer to work with your host systems and emulation, such as LQ-1600K, KS, or KSSM. Follow the instructions provided in Chapter 3, “Configuring the Printer.”

NOTE: If you are replacing a Printronix printer, such as a P300, with this printer, make sure you review the information on the Configuration Utility diskette. The Configuration Utility diskette contains information that will help you configure this printer to match the configuration of the printer you are replacing.

8. Install and/or configure optional features by following instructions provided in the appropriate feature manual.

NOTE: For more detailed information about any optional feature, refer to the manual that was shipped with the feature. If you want to order a manual to learn more about these features, see the “Related Documents” section that begins on page 12.

Before You Begin

Read this chapter carefully before installing and operating the IBM 6400-D Generation II Series printer.

The printer is easy to install, but for your safety and to protect valuable equipment, perform all the procedures in this chapter in the order presented.

IMPORTANT

Make sure you have a way to move the printer and shipping pallet. You will need a pallet jack.

Make sure you have adequate room to maneuver the shipping pallet and printer to the location where you plan to install the printer.

CAUTION:

>55 kg (121 pounds)

<1> Two people are required to unload the printer from the shipping pallet. The shipping weight of the cabinet model is 129.3 kilograms (285 pounds). The shipping weight of the pedestal model printer is 72.6 kilograms (160 pounds).

<2> Requires special equipment for specially trained personnel, such as riggers or movers.

Select A Site

Select a printer site that meets the following requirements:

- Cabinet models: Permits complete opening of the printer cover and both doors of the floor cabinet. See dimension requirements in Figure 2.
- Pedestal models: Permits complete opening of the printer cover and good access to the paper areas at the front and rear of the printer. See dimension requirements in Figure 2. In addition, the location for the pedestal models must be able to handle the acoustics level of the printer.
- Has a power outlet that supplies 100 to 120 Volts AC or 200 to 240 Volts AC at 47 to 63 Hz. The printer automatically senses and adjusts itself to conform to the correct voltage range. For more information, see the input voltage characteristics in Appendix A, “Printer Specifications.”
- Is relatively dust-free.
- Has a temperature range of 10° C to 40° C (50° F to 104° F), and a relative humidity from 10% to 90% (noncondensing).
- Is located within the maximum allowable distance to the host computer. This distance depends on the type of interface you plan to use, as shown in the following table:

Type of Interface	Maximum Distance to Host
PC Parallel (See Note below)	**5 meters (15 feet)**
IEEE 1284 Parallel (See Note below)	**10 meters (32 feet)**
Serial RS-232	**15 meters (50 feet)**
Serial RS-422	**1220 meters (4000 feet)**

NOTE: For more reliable data transfers, a maximum of six feet is recommended for parallel cable length.

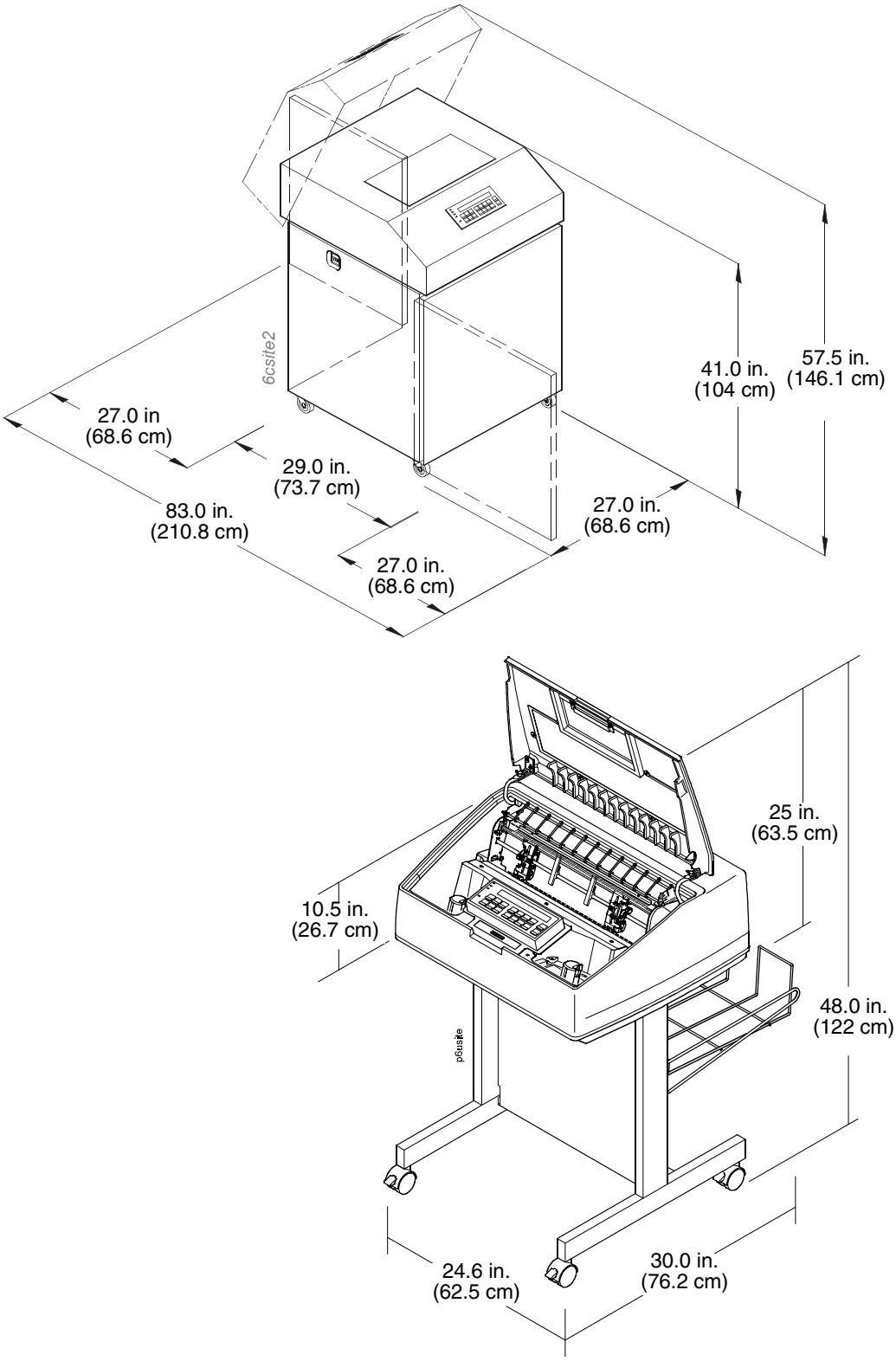


Figure 2. Printer Dimensions

Printer Component

Locations

Familiarize yourself with the names and locations of the printer components shown in the following figures before continuing with the rest of the installation procedure.

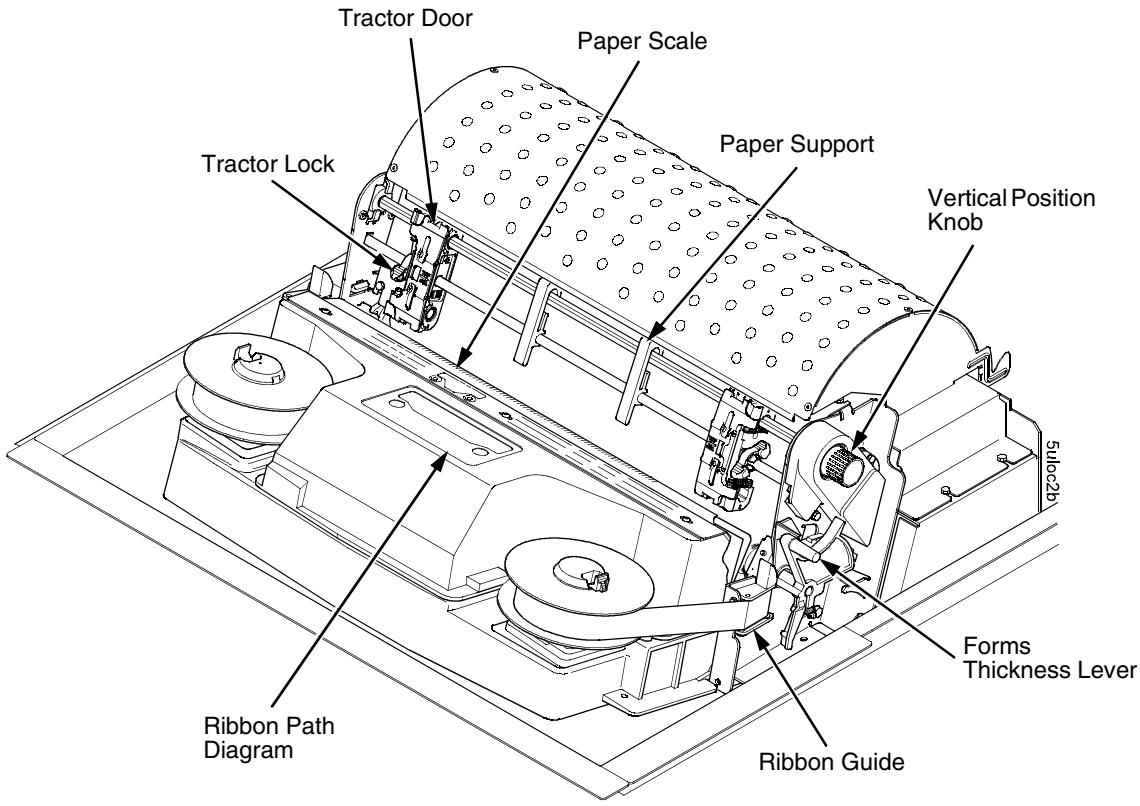


Figure 3. Cabinet Model Component Locations

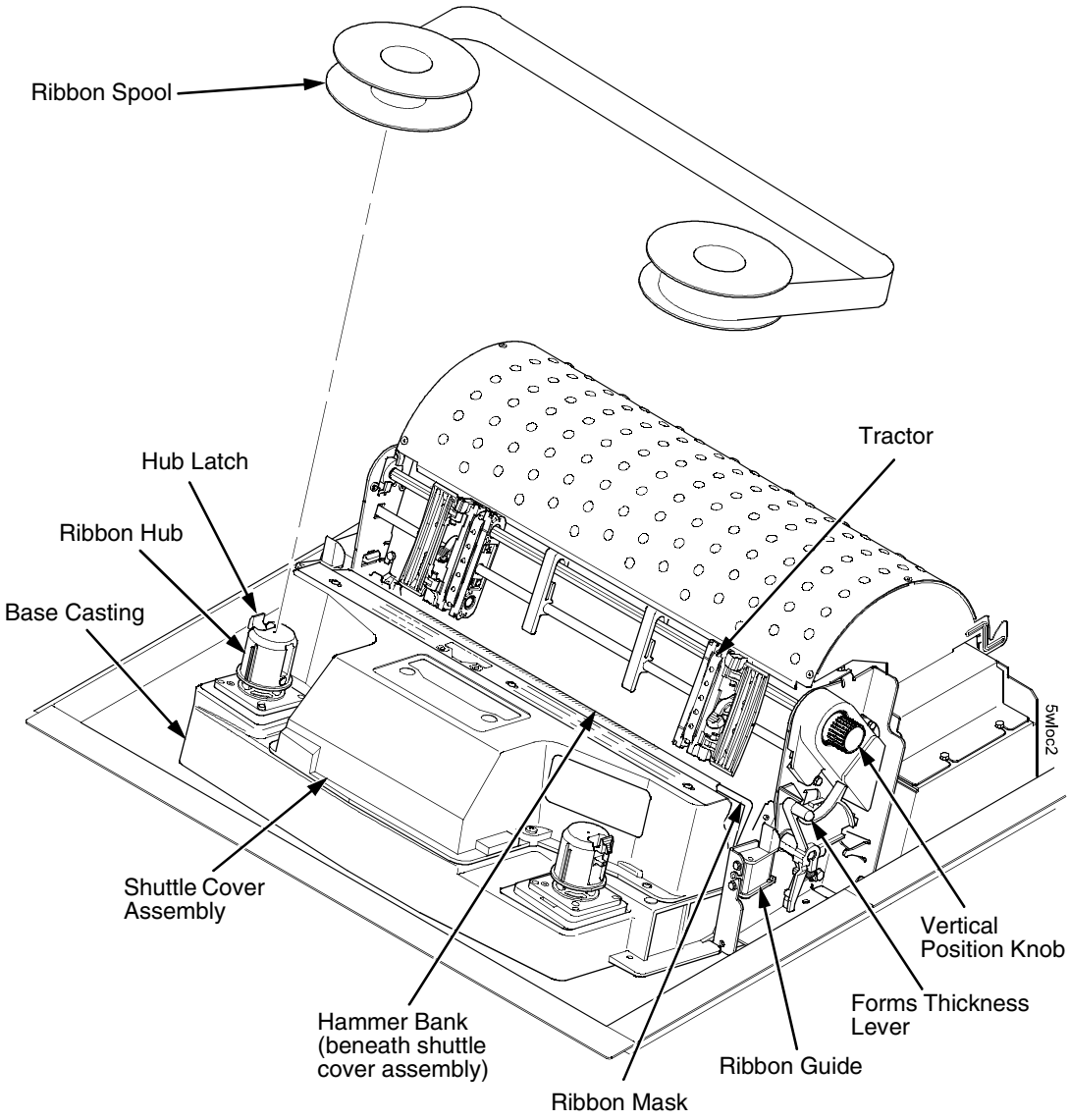


Figure 4. Cabinet Model Component Locations (Cont.)

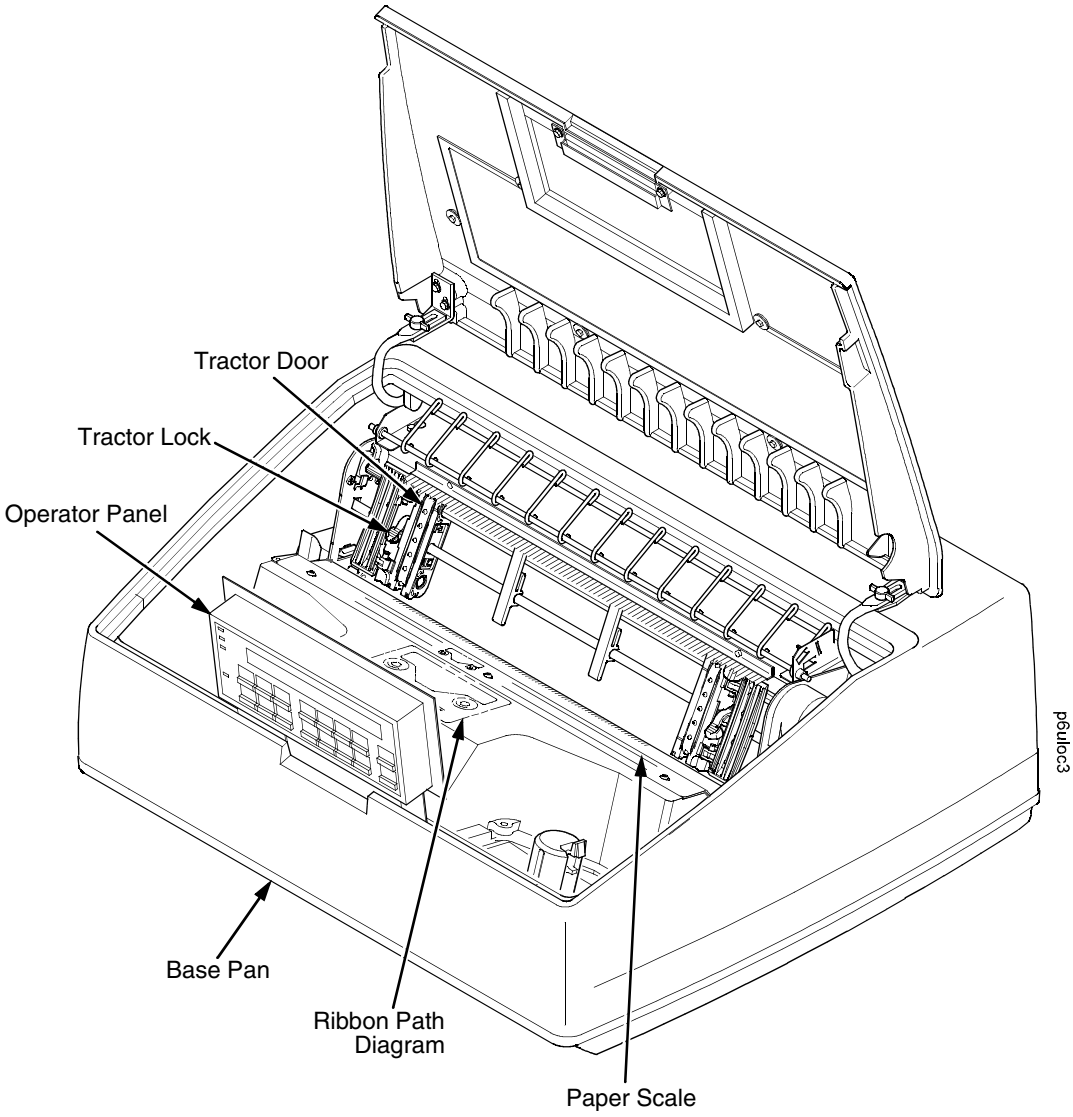


Figure 5. Pedestal Model Component Locations

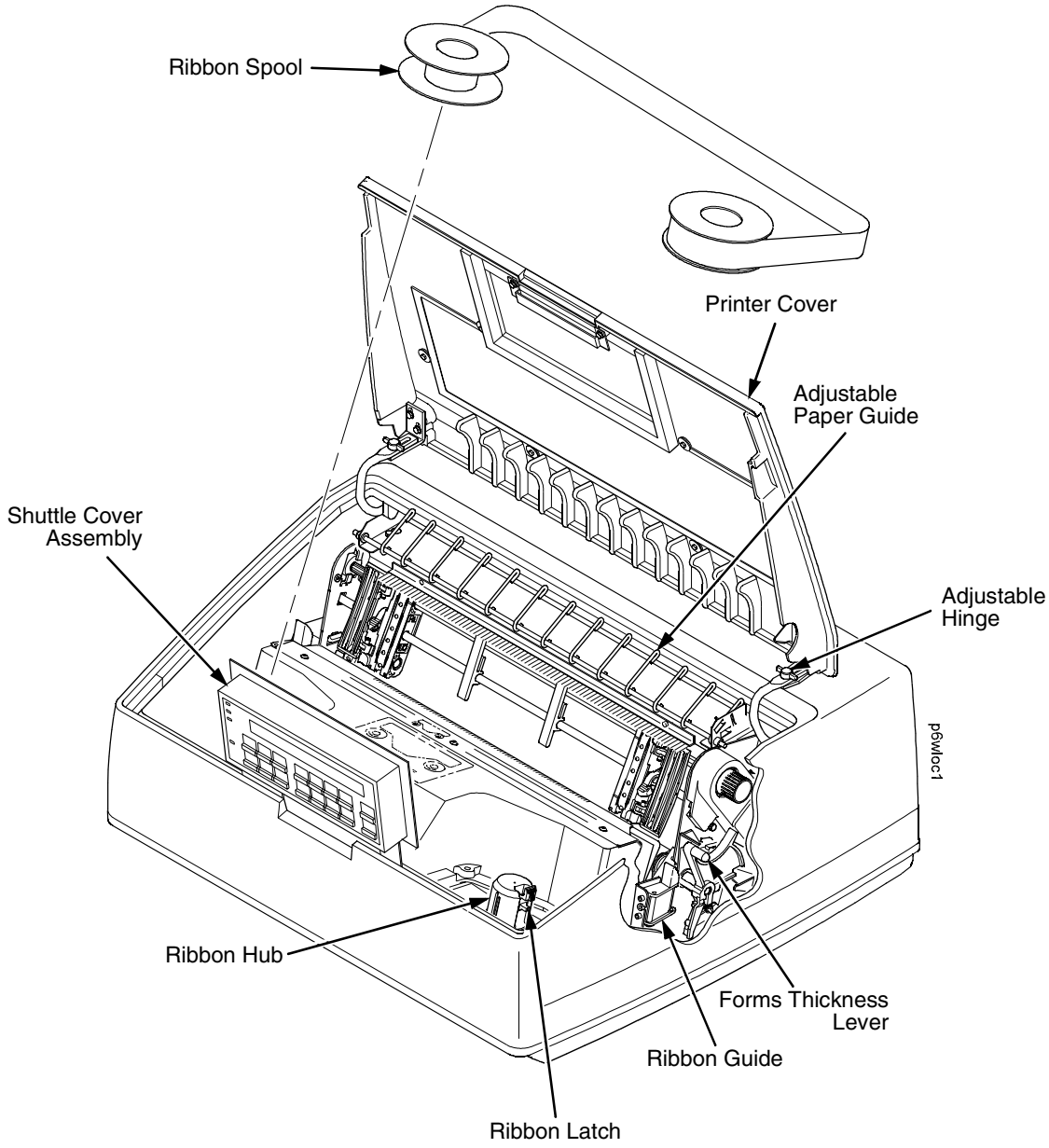


Figure 6. Pedestal Model Component Locations (Cont.)

Removing Shipping Restraints (Cabinet Models)

Follow the instructions on the shipping package to perform these steps:

1. Remove shipping restraints from front of shipping pallet.
2. Move printer from shipping pallet.
3. Remove remaining shipping restraints from pallet.
4. Remove remaining packing material.

Cardboard packing, protective foam, and tie wraps protect printer mechanisms from possible damage during shipment. You must remove these shipping restraints before you operate the printer.

Save the cardboard packing and protective foam with the other packing materials.

To avoid shipping damage, reinstall the shipping restraints whenever the printer is moved or shipped. To reinstall the shipping restraints, simply reverse the steps in this section.

Remove The Cardboard Packing And Envelope

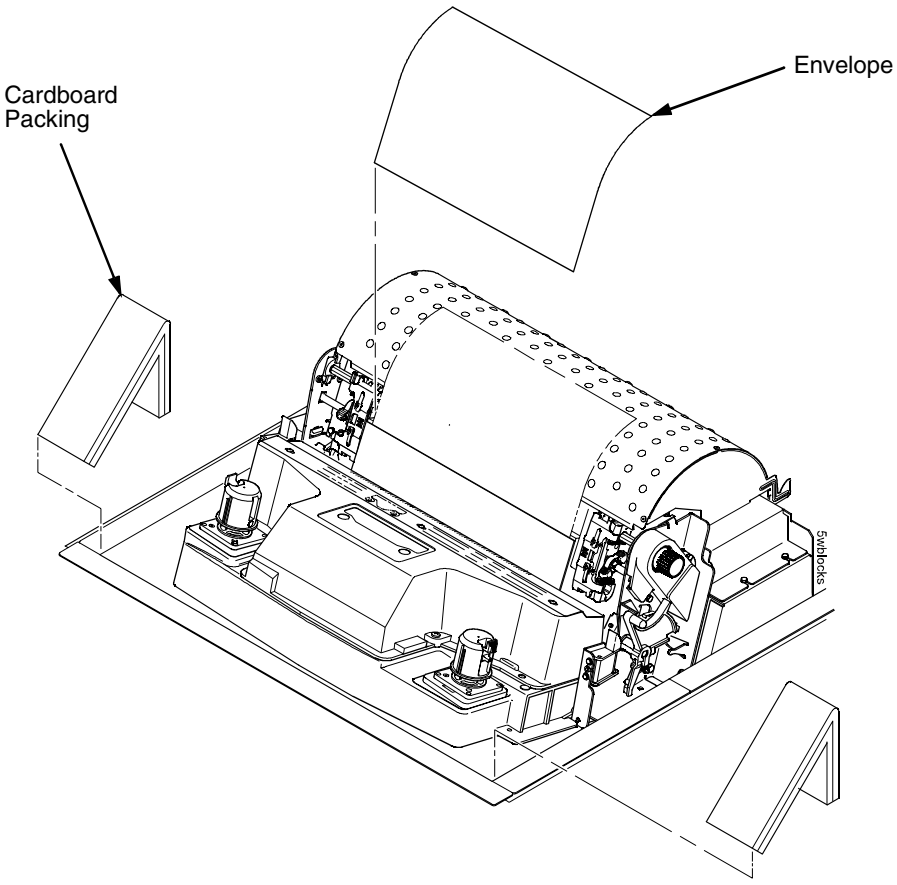


Figure 7. Removing the Cardboard Packing and Envelope

1. Raise the printer cover.
2. Remove the cardboard packing.
3. Open the tractor doors. Push the tractor locks down. Slide the tractors outward as far as they will go. The forms thickness lever should be in the fully open (raised) position.
4. Remove the envelope that contains the sample configuration printout. Store this in the pouch that is attached to the left interior side of the cabinet.

Remove The Hammer Bank Protective Foam

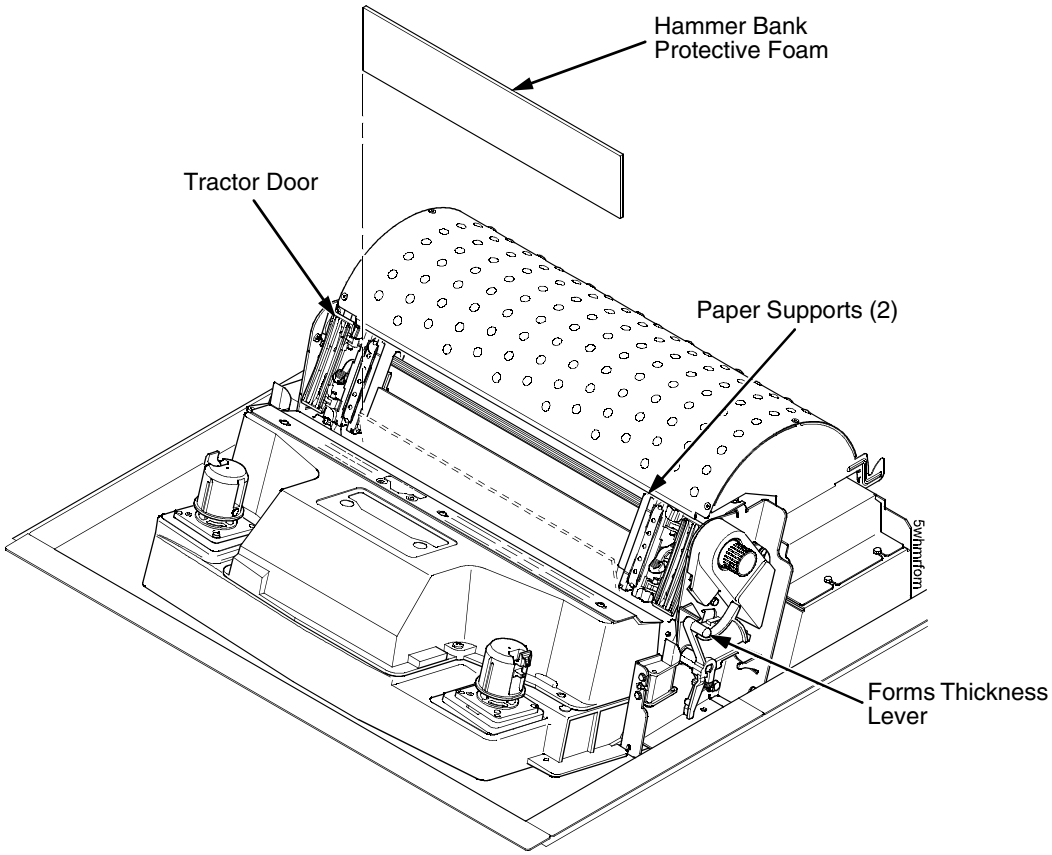


Figure 8. Removing the Hammer Bank Protective Foam

1. Slide the paper supports outward as far as they will go. Lift the hammer bank protective foam and remove it from between the ribbon mask and the platen.
2. Rotate the forms thickness lever downward to position “A.”

Remove The Platen Protective Foam

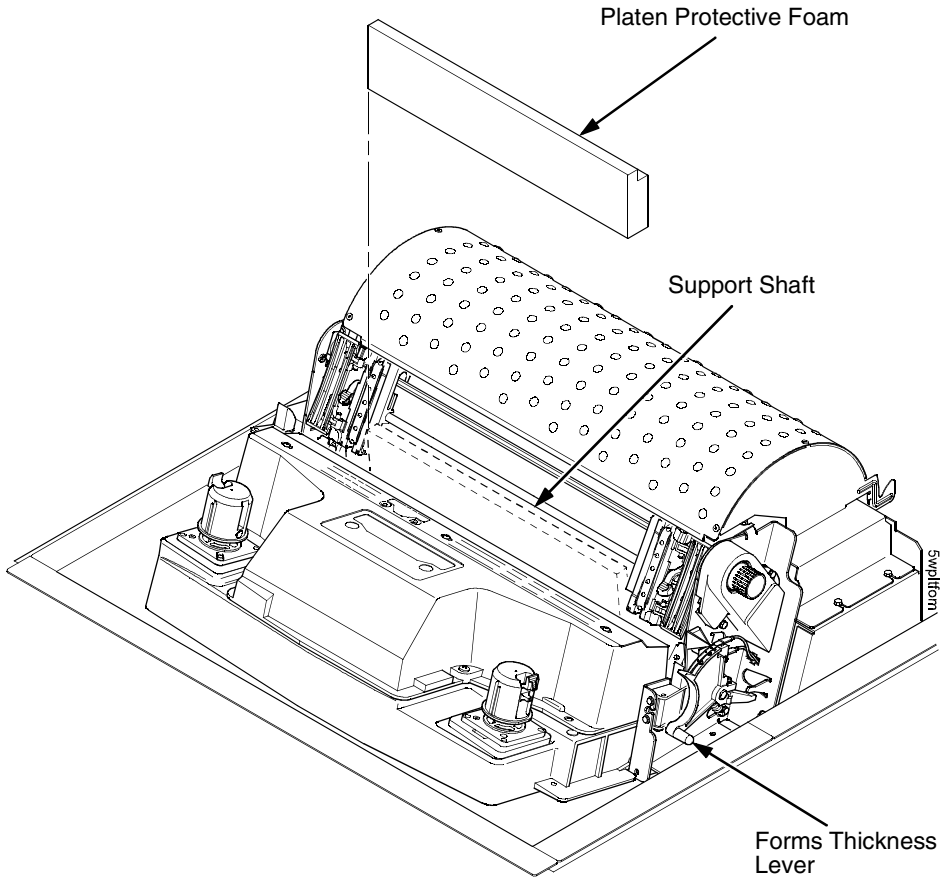


Figure 9. Removing the Platen Protective Foam

1. Rotate the platen protective foam toward the front of the printer and out from under the support shaft.
2. Remove the platen protective foam.

Remove Wood Blocks

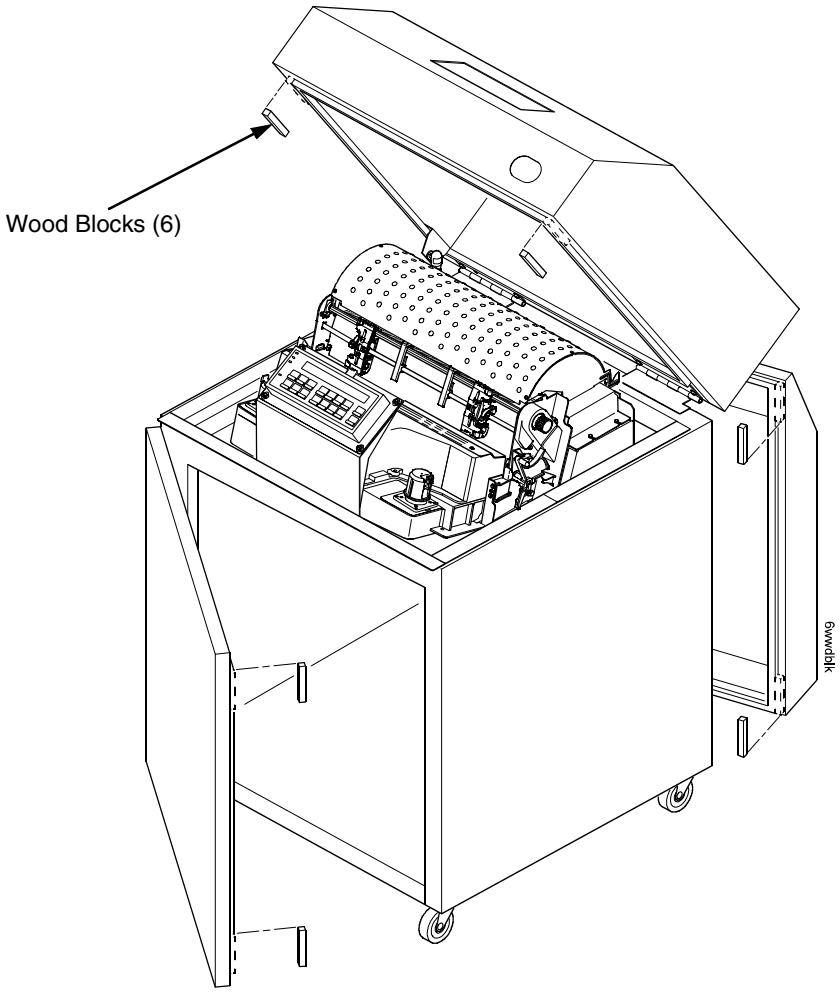


Figure 10. Removing the Foam Strips and Protective Film

1. Slide the two paper supports toward the center of the support shaft. Position them so that they divide the space between the tractors into three approximately equal segments. See Figure 10.
2. Remove the foam strips and the tape securing the foam strips.
3. Carefully peel off the tape and lift the protective film off the operator panel message display.

Adjust The Paper Supports

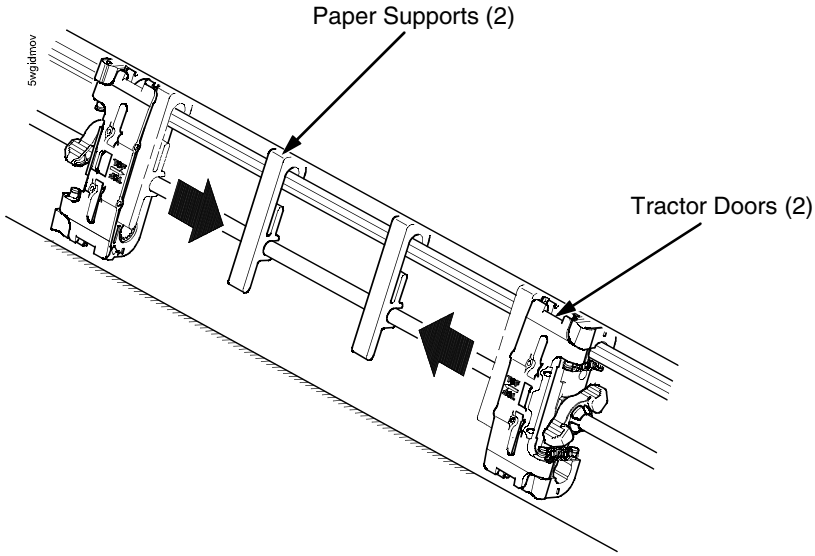


Figure 11. Paper Supports with Directional Arrows Showing the Adjustment Capabilities

Slide the paper supports inward until they are approximately four inches from the tractor doors.

Release The Paper Chains

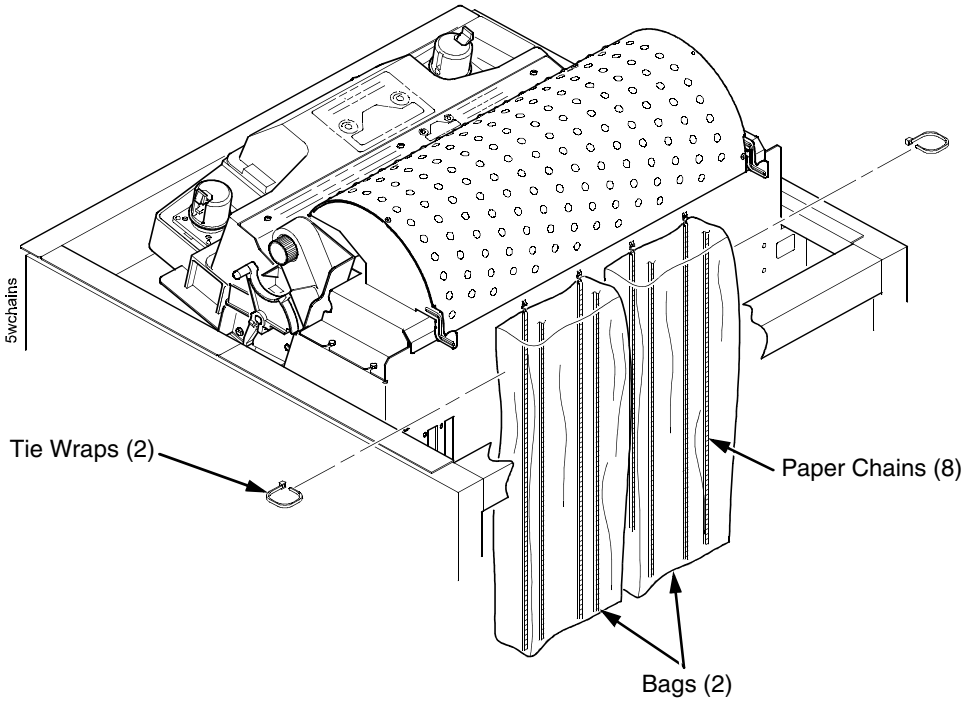


Figure 12. Releasing the Paper Chains

1. Open the cabinet rear door.
2. Cut the tie wraps and release the paper chains from the bags at the top rear of the printer frame. Remove the tie wraps and bags. See Figure 12.
3. Make sure each chain hangs freely, with no kinks or knots.

Remove Tags

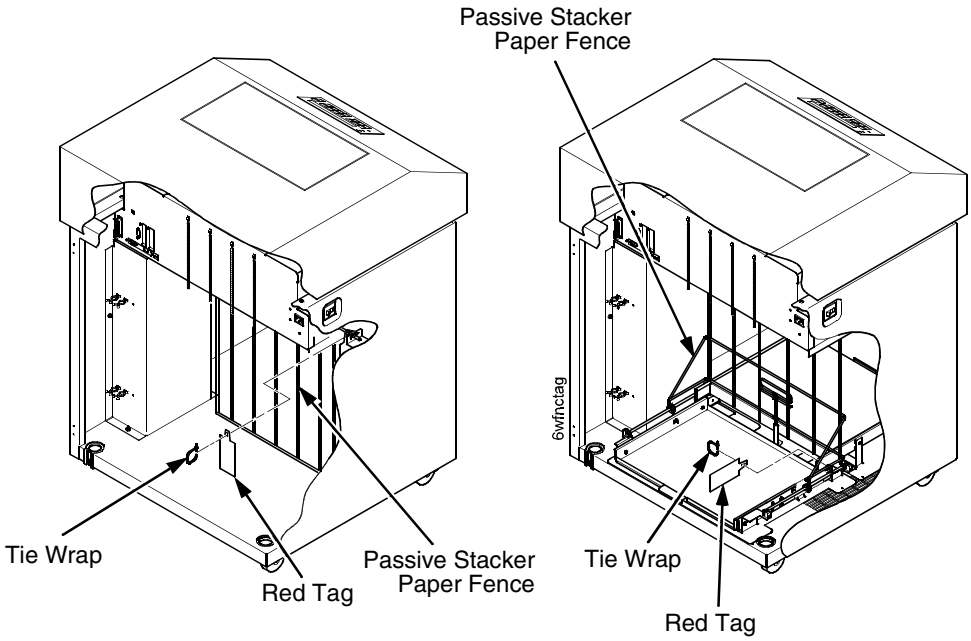


Figure 13. Remove Tag and Clamp from Fence or Passive Paper Stacker

1. Remove the tie wrap that is attached to the paper fence. It is marked with a large, red tag.
2. Close the cabinet rear door.

Removing Shipping Restraints (Pedestal Models)

Protective films and foam blocks protect printer mechanisms from possible damage during shipment. You must remove these shipping restraints before you operate the printer.

Save the foam blocks with the other packing materials.

To avoid shipping damage, reinstall the shipping restraints whenever the printer is moved or shipped. To reinstall the shipping restraints, simply reverse the steps in this section.

Remove The Protective Film And Envelope

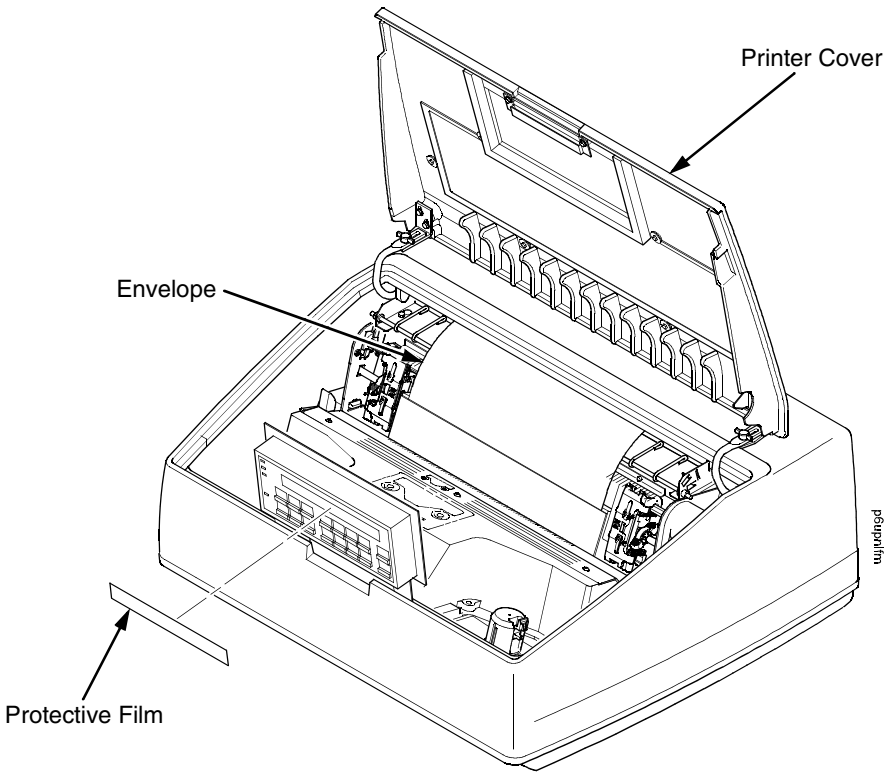


Figure 14. Removing the Protective Film and Envelope

1. Raise the printer cover.
2. Carefully peel off the tape and lift the protective film off the operator panel message display.
3. Open the tractor doors. Push the tractor locks down. Slide the tractors outward as far as they will go. See Figure 15. The forms thickness lever should be raised (in the fully open position).
4. Remove the envelope that contains the sample configuration printout. Store this envelope in a safe place so that you can refer to the configuration printout.

Remove The Hammer Bank Protective Foam

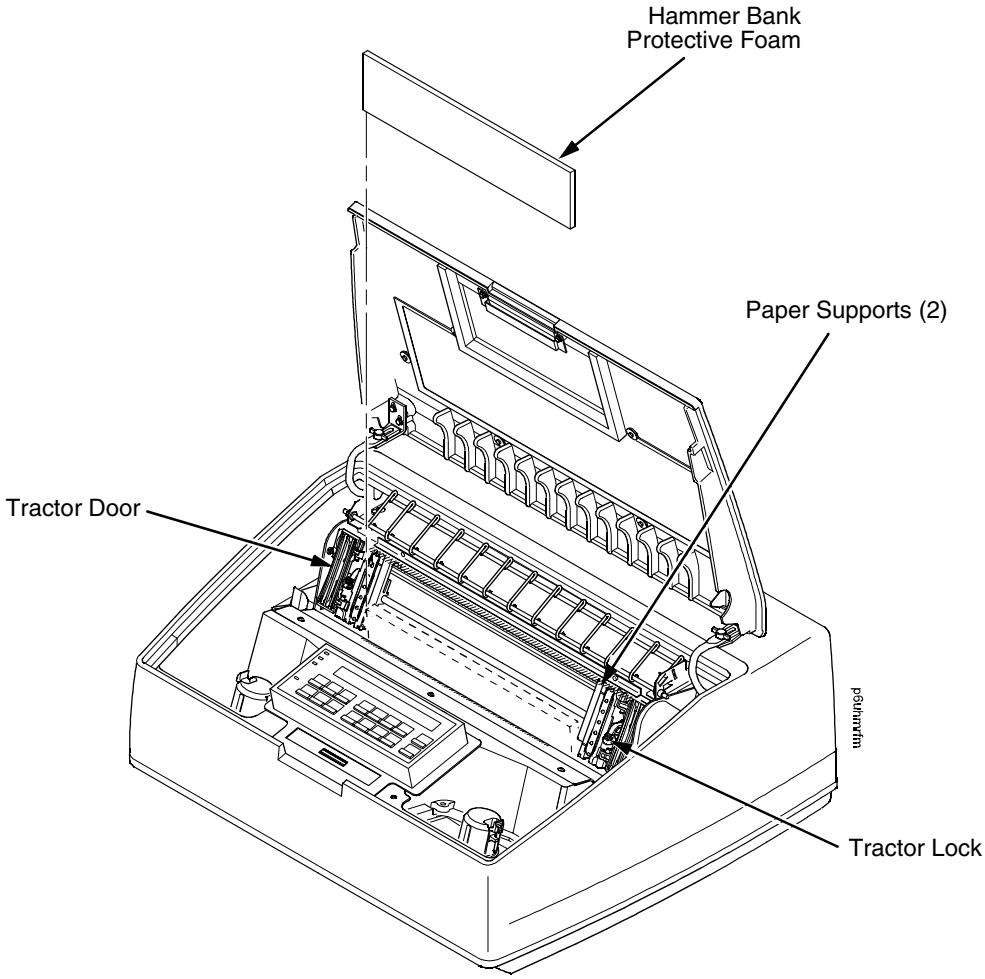


Figure 15. Removing the Hammer Bank Protective Foam

1. Slide the paper supports outward as far as they will go.
2. Lift the hammer bank protective foam and remove it from between the ribbon mask and the platen.

Remove The Platen Protective Foam

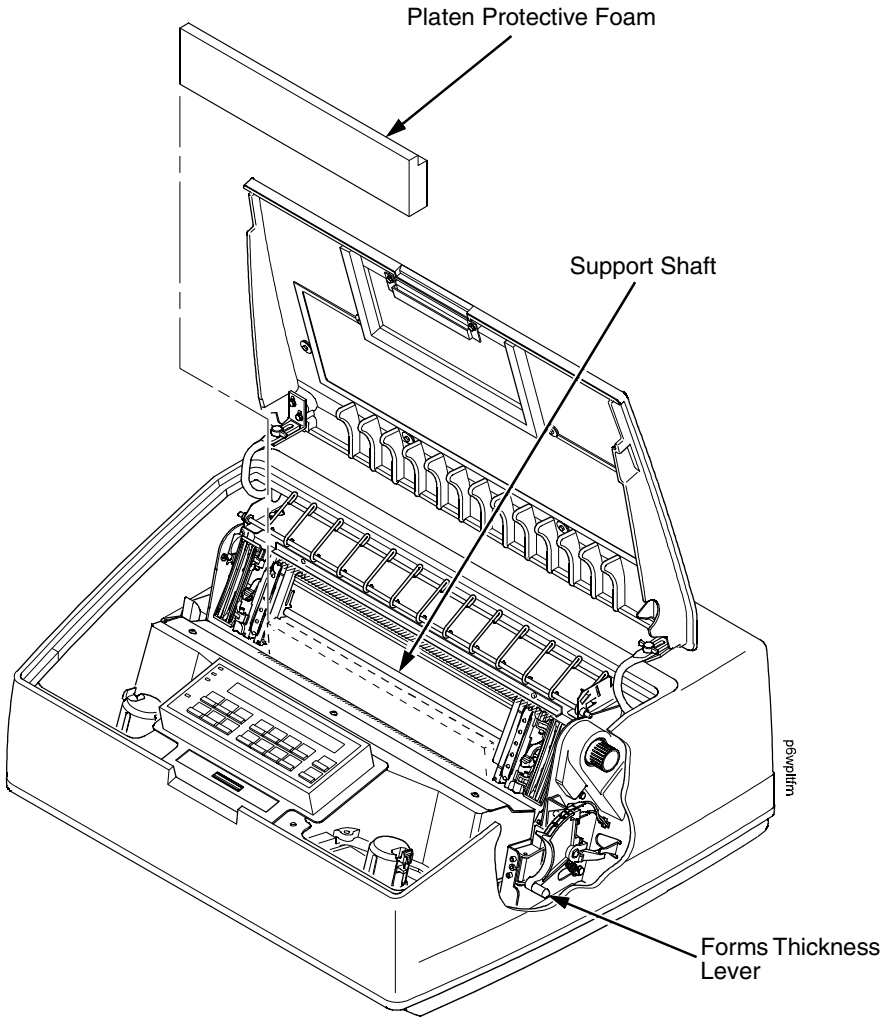


Figure 16. Removing the Platen Protective Foam

1. Rotate the forms thickness lever downward (to position “A”). See Figure 16.
2. Rotate the platen protective foam toward the front of the printer and out from under the support shaft. Remove the platen protective foam.

Attach The Input Paper Shelf And Output Basket

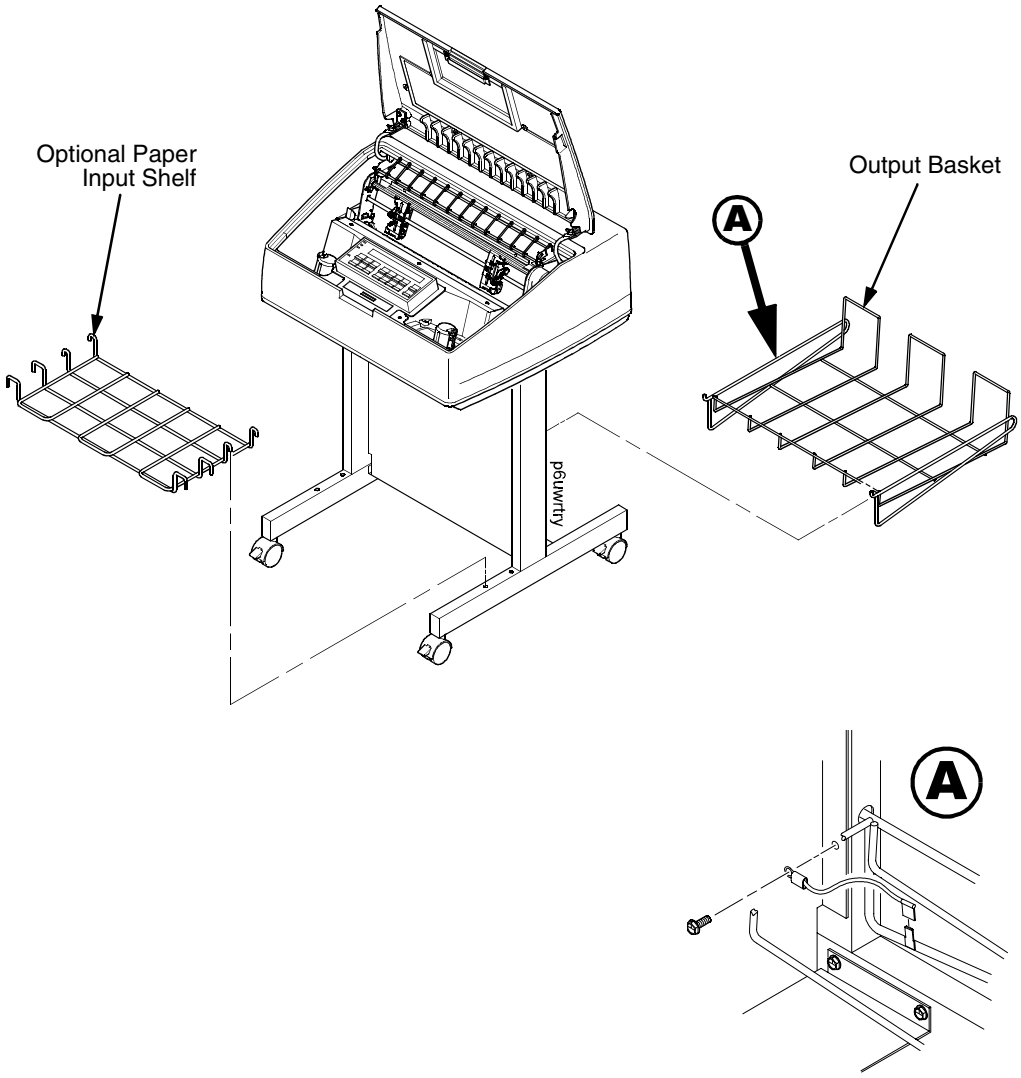


Figure 17. Attaching the Input Paper Shelf and Output Basket

1. Slide the two paper supports toward the center of the support shaft. Position them so that they divide the space between the tractors into three equal segments. See Figure 17.
2. Place the output basket in the holes on the back of the printer and attach the ground strap as shown in Figure 17, detail A.
3. Place the input paper shelf (which is an optional feature) in the holes in the front of the pedestal base.

Connect The Interface And Power Cables

Cabinet Models

DANGER:

<1>	**Before powering on the printer ensure the printer is plugged into an appropriate power source. Refer to Chapter 2 of the *Setup Guide* for information on the proper source.**
<4>	**Do not connect or disconnect any communication port, teleport, attachment connector, or power cord during an electrical storm.**
<5>	**Power off the printer and disconnect the power cord before connecting or disconnecting any communication port, teleport, or attachment cable connector.**

1. Verify that the voltage source at the printer site conforms to the requirements specified on page 19. Make sure that the printer power switch is set to Off. See Figure 18.
2. Open the cabinet front door, remove and open the cardboard box containing the power cord, printer ribbon, and operator panel overlay label. Refer to Appendix A, “Printer Specifications,” for recommended cables. Documentation is stored in a pouch container on the left interior side of the cabinet.
3. Referring to Figure 18 through Figure 23, connect the customer-supplied interface cable from the host computer to the appropriate printer interface connector.
4. Thread the power cable connector up through the notch in the lower right back corner of the cabinet (see Figure 18). Plug the power cord into the printer AC power connector, then into the AC power outlet.

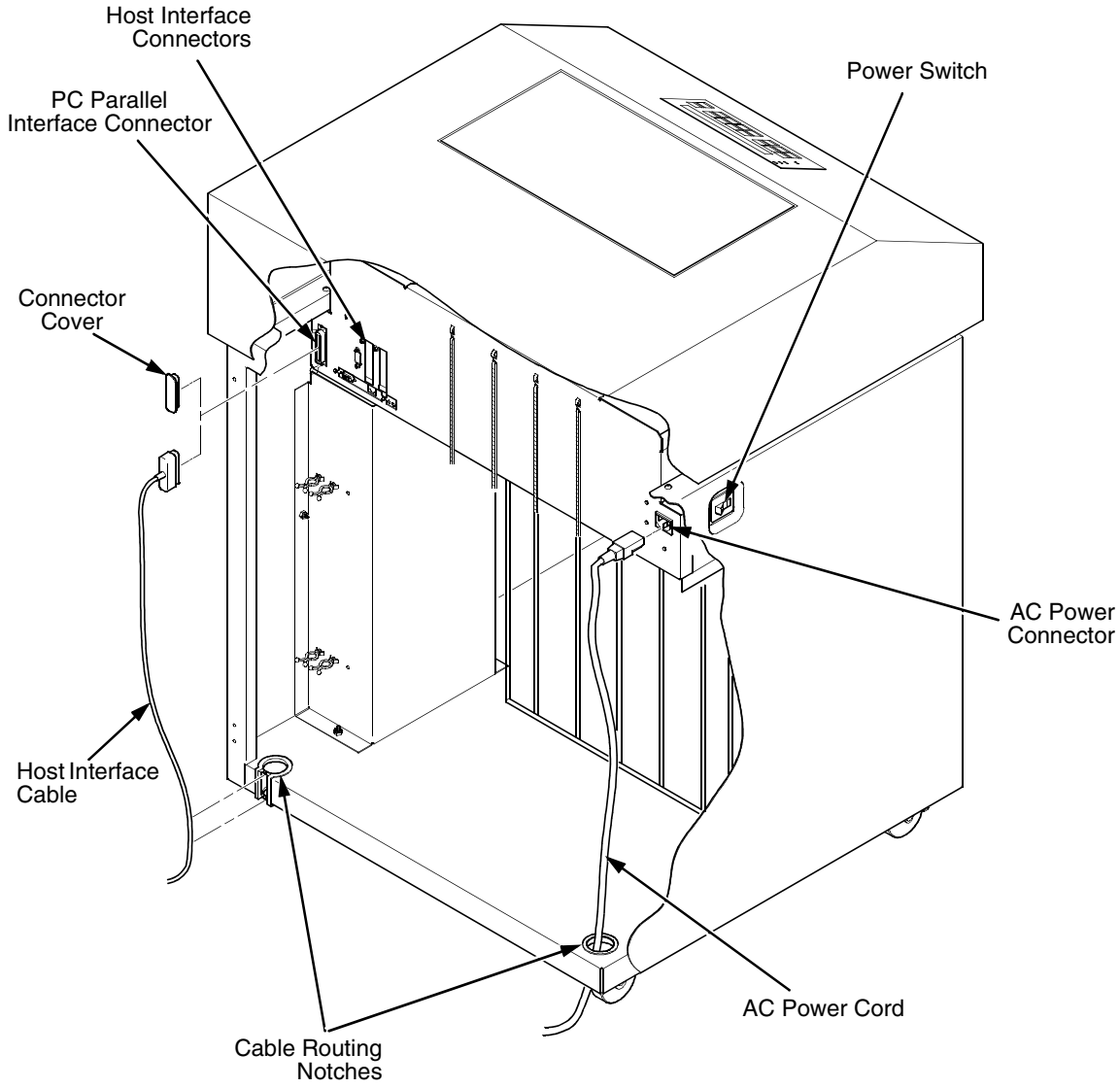


Figure 18. Interface and Power Cable Connections, Cabinet Models

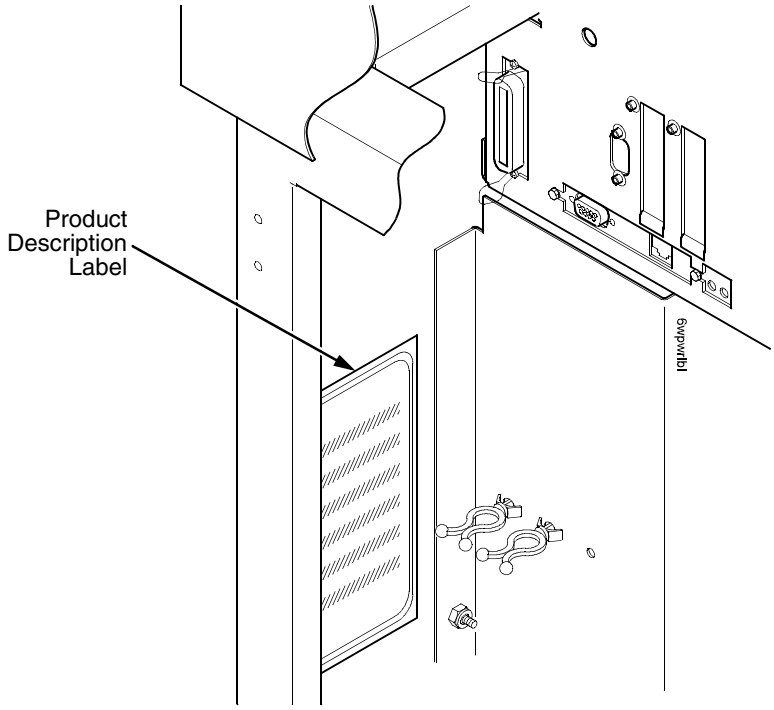


Figure 19. Product Description Label Location

1. Check the product description label to verify that the voltage source at the printer site conforms to the requirements specified on page 19. See Figure 19.

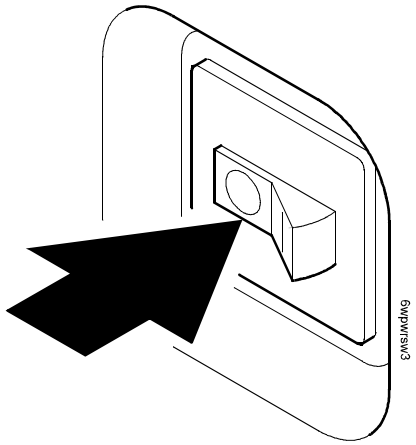


Figure 20. Power Switch

2. Make sure the printer power switch is set to **OFF**.

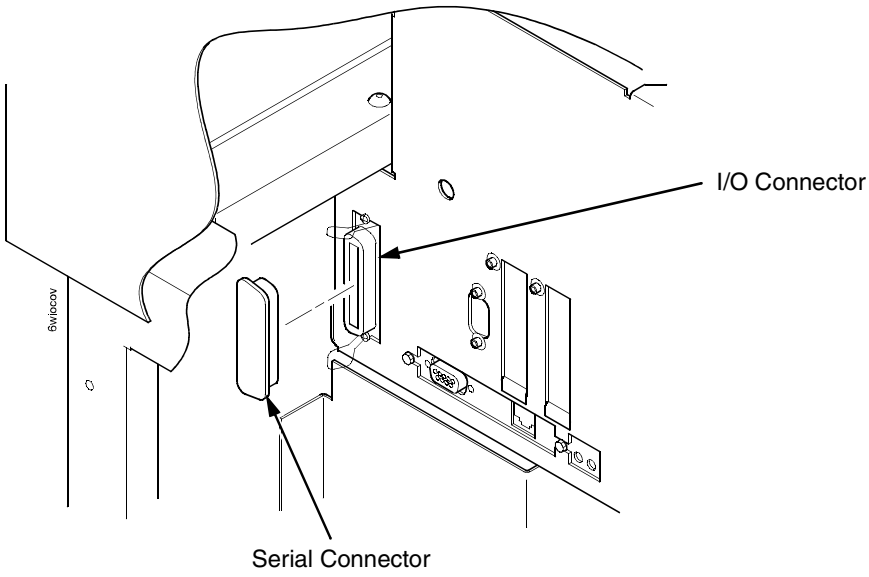


Figure 21. Removing the I/O Cover

3. Open the cabinet rear door and remove the cover from the I/O connector you have selected.

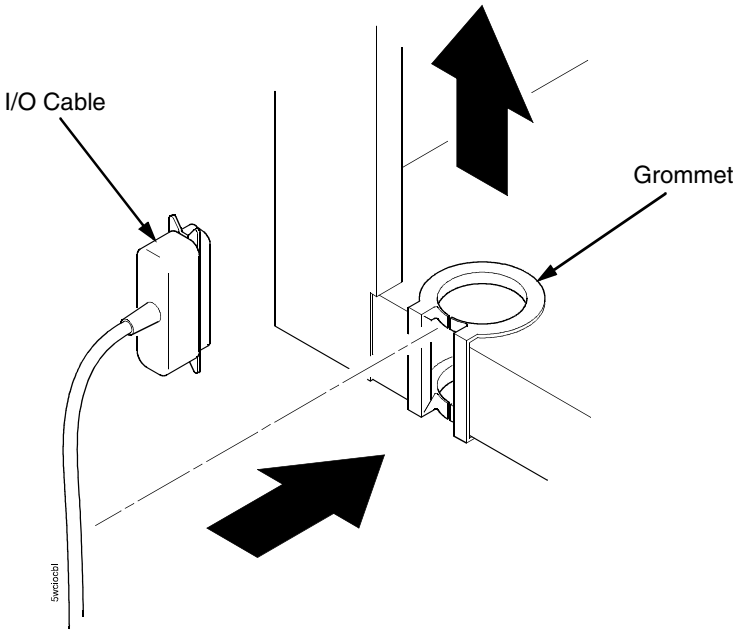


Figure 22. Cable Routing Notch

4. Locate the notch in the lower left corner of the back of the cabinet.
5. Hold the I/O cable below its connector, and gently push the cable through the opening in the grommet seated in the notch.

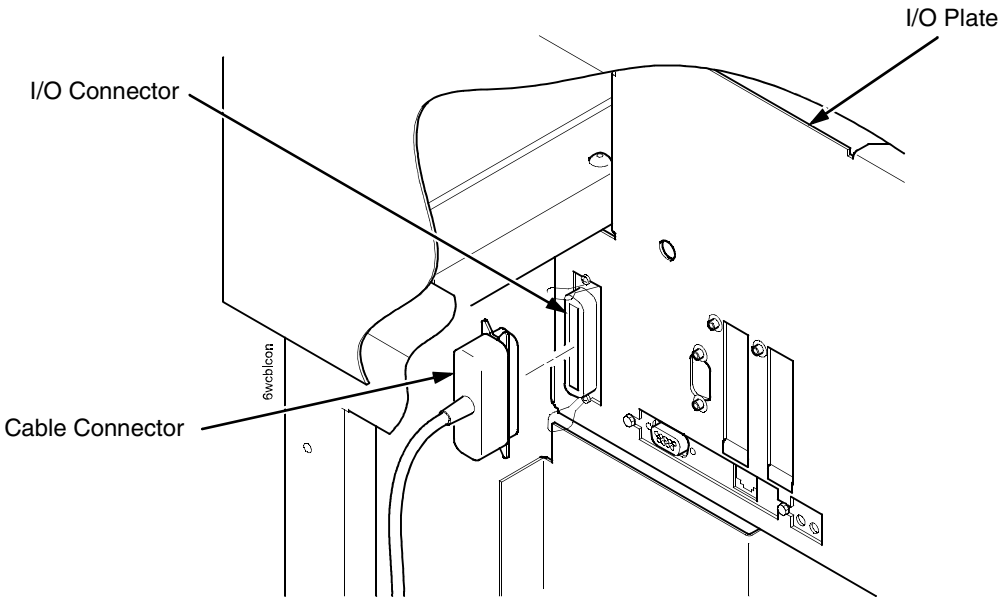


Figure 23. Cable Connector Attachment

6. Pull the cable up through the notch until it reaches the I/O plate. Attach the cable connector to the printer interface connector previously selected in step 3 of this section.
7. Secure the cable to the printer using the two cable standoffs. See Figure 18.

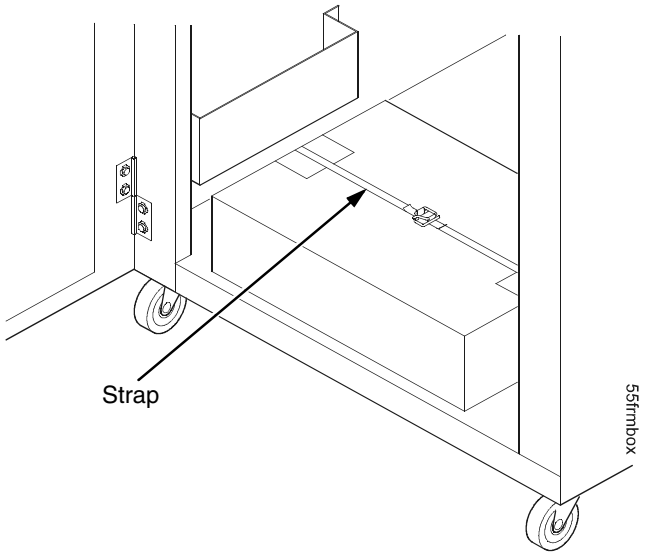


Figure 24. Open Cabinet Front Door Showing the Printer Accessories Package

8. Open the cabinet front door and cut the strap that secures the box, which contains the power cord, control panel overlay labels, and documentation.
9. Open the box and remove the power cord, overlays, and documentation.

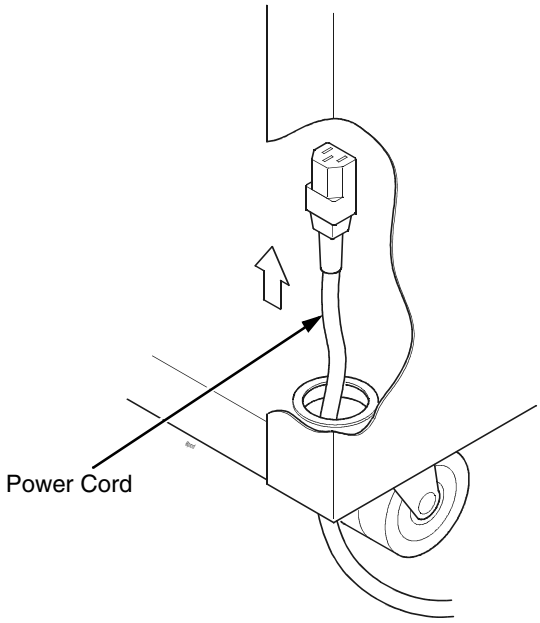


Figure 25. Routing the Power Cord

10. Guide the power cord up through the hole in the lower right back corner of the cabinet. Thread the power cord inside the bracket where the gas spring is attached.

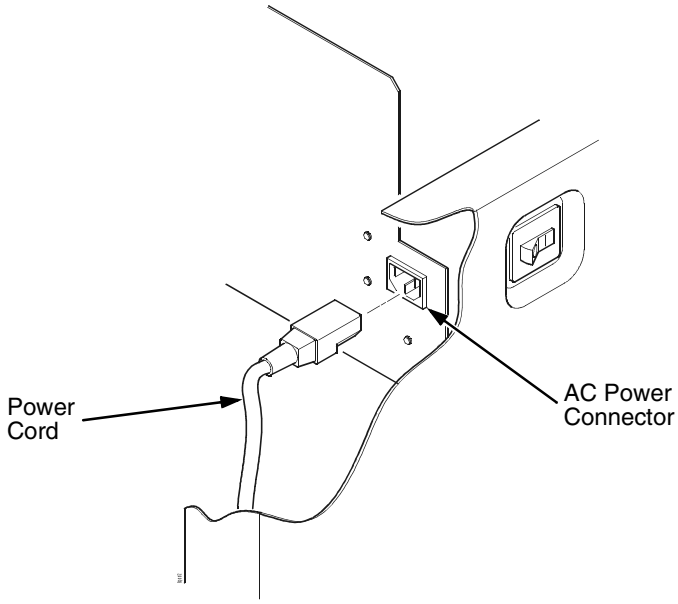


Figure 26. Attaching the Power Cord

11. Plug the power cord into the printer AC power connector, then into the AC power outlet.

Pedestal Models

DANGER:

<1>	**Before powering on the printer ensure the printer is plugged into an appropriate power source. Refer to Chapter 2 of the *Setup Guide* for information on the proper source.**
<4>	**Do not connect or disconnect any communication port, teleport, attachment connector, or power cord during an electrical storm.**
<5>	**Power off the printer and disconnect the power cord before connecting or disconnecting any communication port, teleport, or attachment cable connector.**

1. Verify that the voltage source at the printer site conforms to the requirements specified on page 19. Make sure that the printer power switch is set to Off. (See Figure 20.)
2. Open the box containing the power cord, printer ribbon, and operator panel overlay label. Refer to Appendix A, “Printer Specifications,” for recommended cables.
3. Referring to Figure 28 and Figure 29, connect the (customer-supplied) interface cable from the host computer to the appropriate printer interface connector:
   a. Remove the cover from the I/O connector(s) you have selected.
   b. Attach the cable connector to the printer interface connector.
4. Plug the power cord into the printer AC power connector, then into the AC power outlet (see Figure 30).

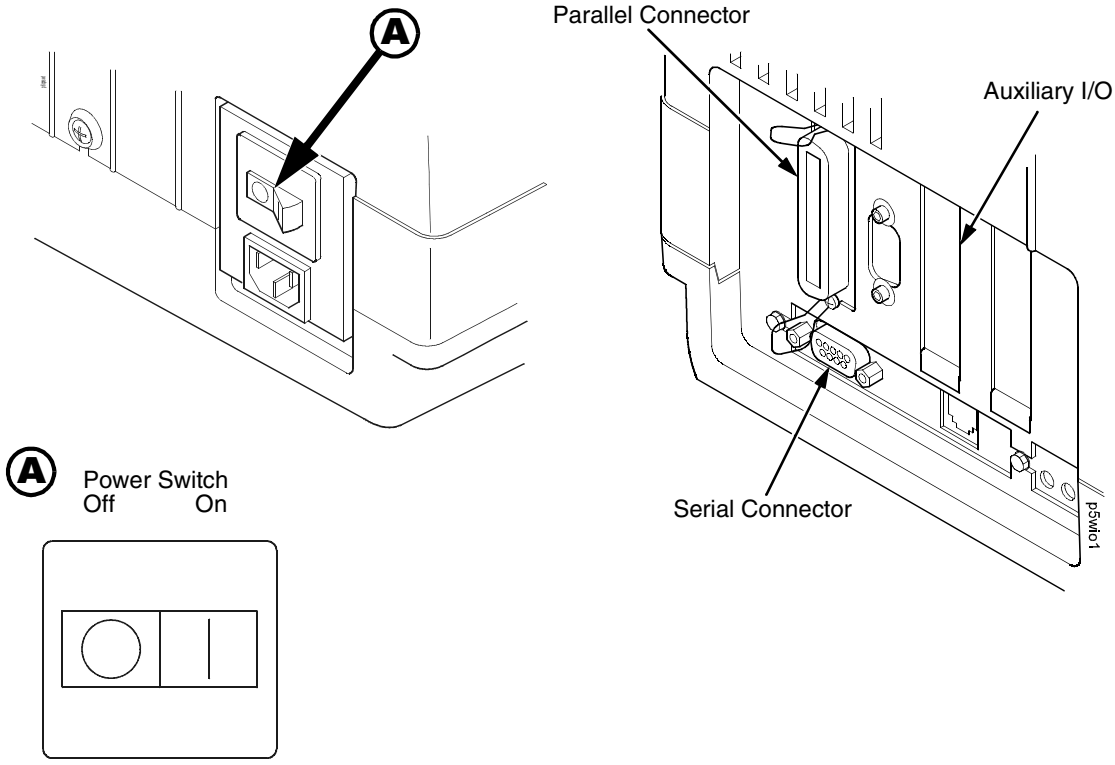


Figure 27. Interface and Power Cable Connections, Pedestal Models

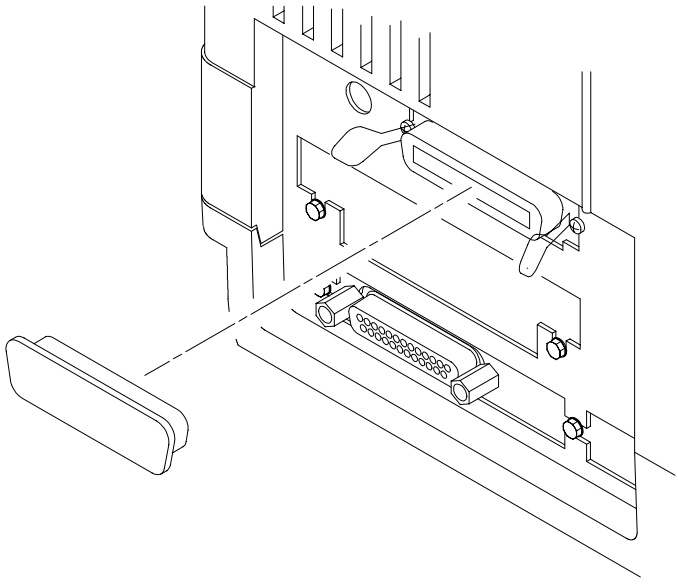


Figure 28. Removing the I/O Cover

5. Remove the cover from the I/O connector you have selected.

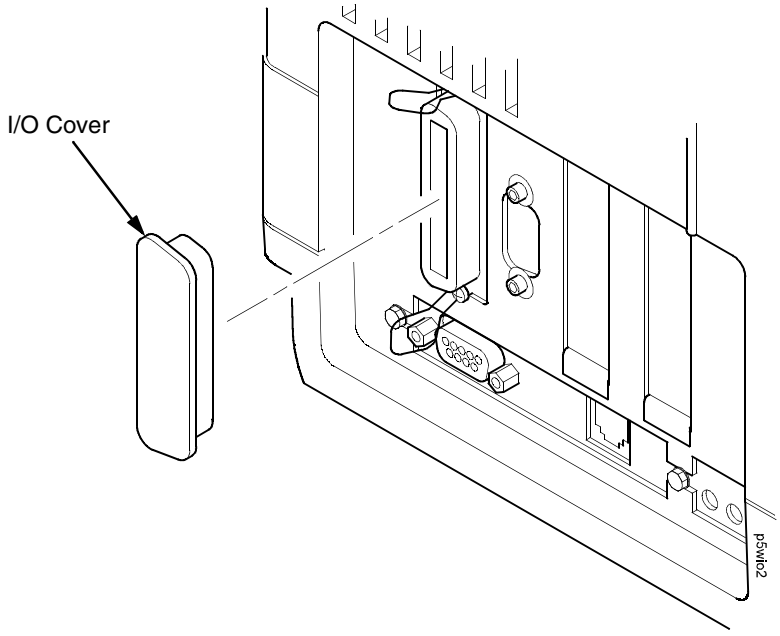


Figure 29. Attaching the Cable Connector

6. Attach the cable connector to the printer interface connector.

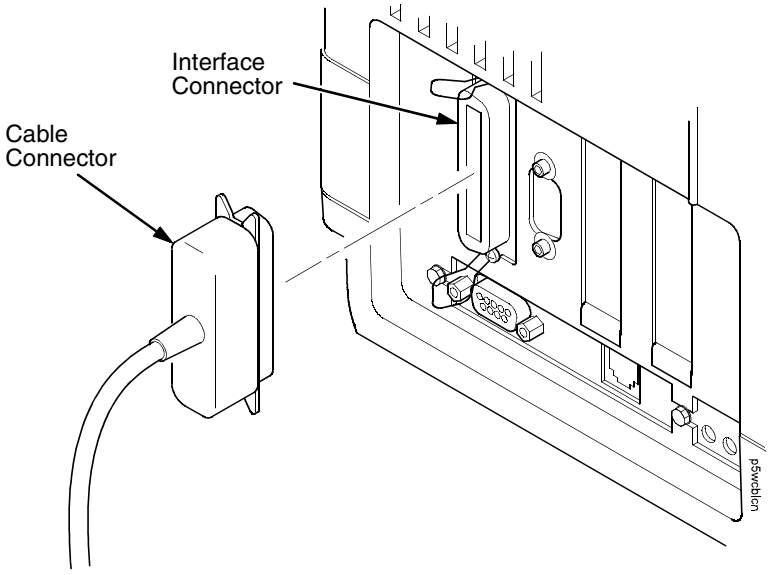


Figure 30. Attaching the Power Cord

7. Plug the power cord into the printer AC power connector, then into the AC power outlet.

Install Basic Components

Attach The Operator Panel Overlay Label

Attach the operator panel overlay label by adhering it to your operator panel. See Figure 31.

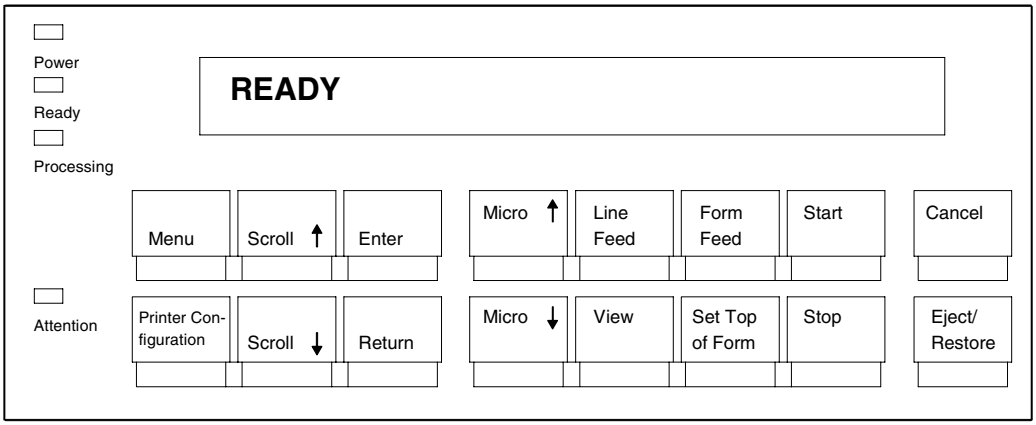


Figure 31. The Operator Panel Overlay Label

Install The Ribbon

1. Refer to the ribbon path diagram molded onto the shuttle cover for the following steps. See Figure 3.

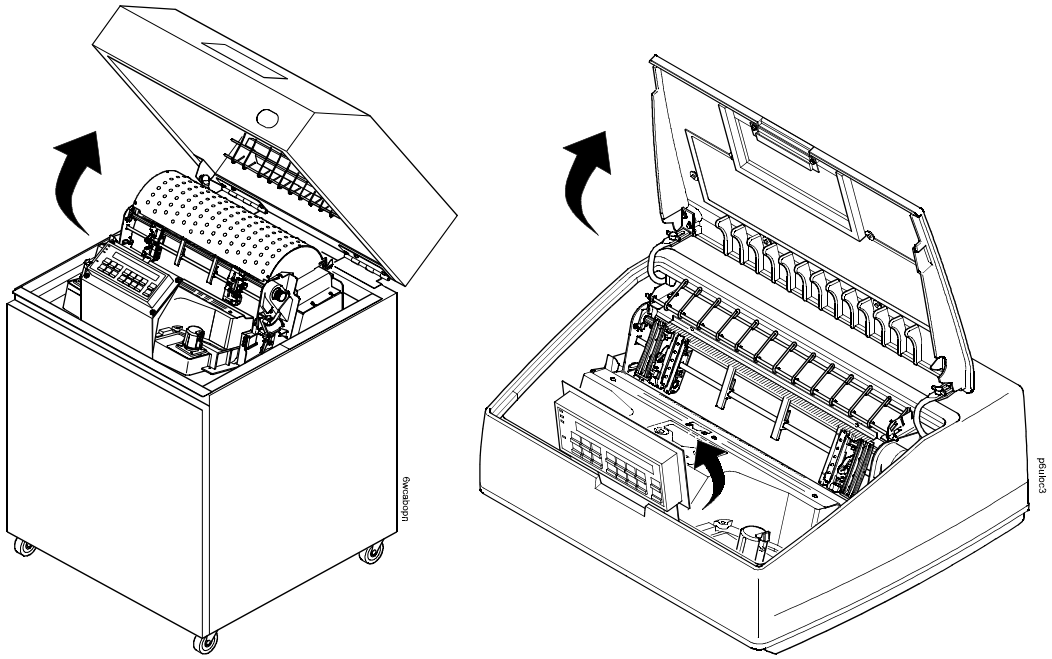


Figure 32. Opening the Printer Cover

2. Open the printer cover. See Figure 32.
3. On pedestal models, swing the operator panel up and forward to provide clearance.

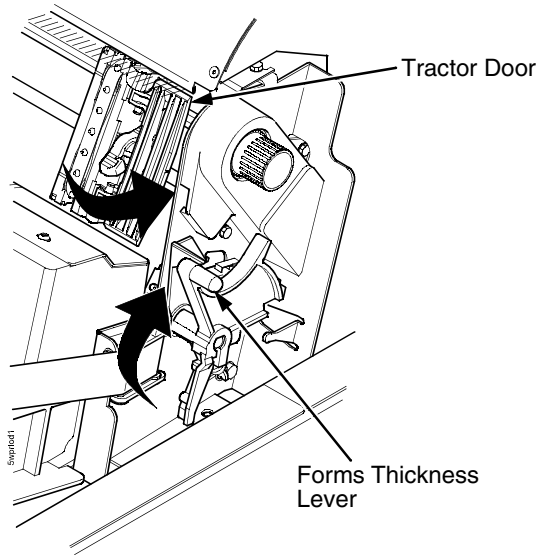


Figure 33. Forms Thickness Lever and Tractor Doors

4. Raise the forms thickness lever as far as it will go. See Figure 33.
5. Open the tractor doors. See Figure 33.
6. Remove the ribbon spools from the package.

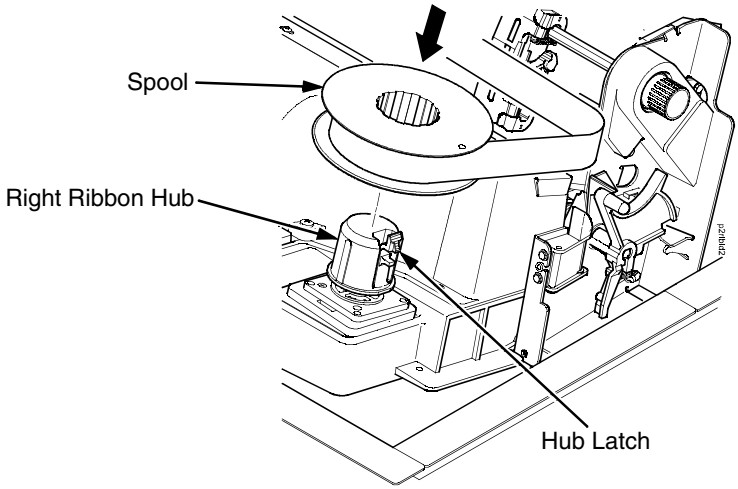


Figure 34. Placing the Ribbon Spool on the Right Ribbon Hub

7. With the ribbon supply to the outside, squeeze the right hub latch and place the full spool on the right ribbon hub. Press the spool down until the hub latch snaps into place. See Figure 34.

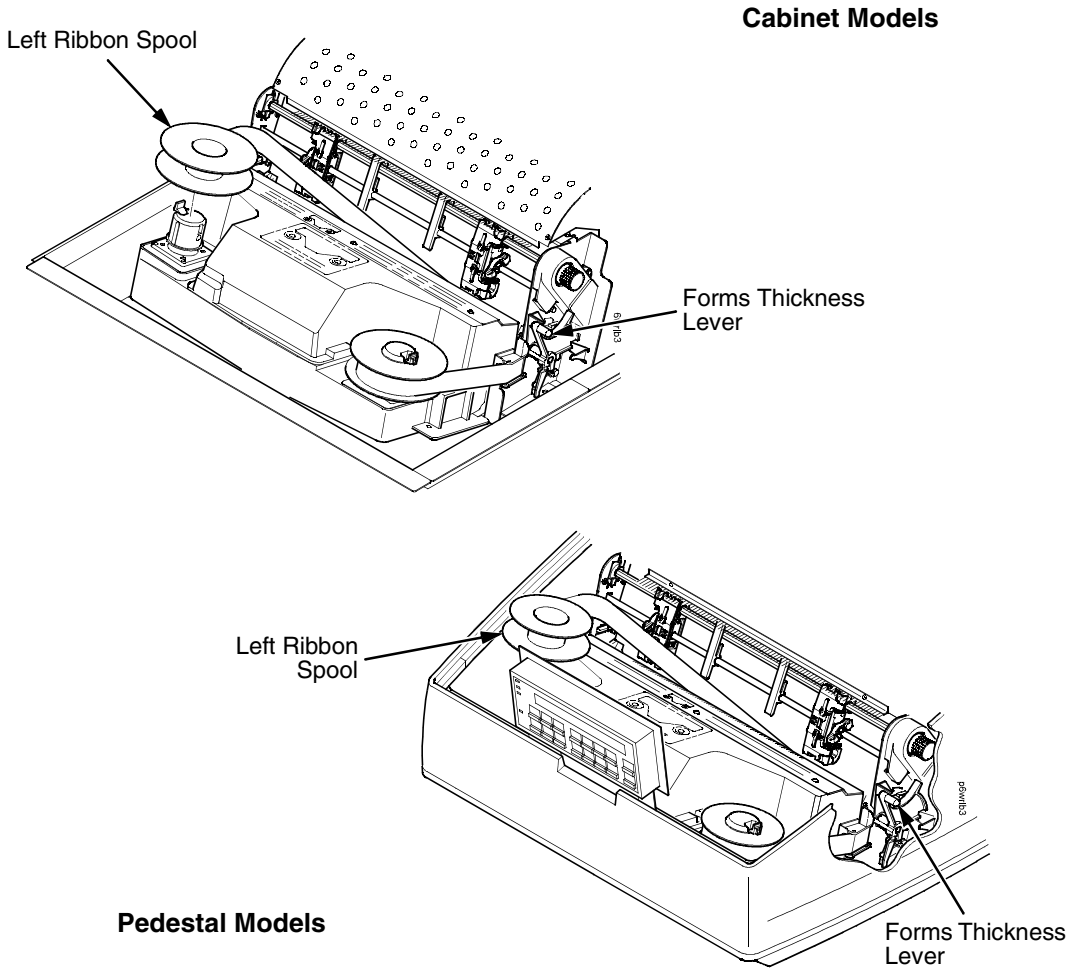


Figure 35.Cabinet and Pedestal Models, Interior View of Ribbon Installation

8. Starting from the right ribbon spool, thread the ribbon around the right ribbon guide, under the right tractor door, between the hammer bank cover and ribbon mask, and along the ribbon path to the left ribbon guide.
9. Place the empty spool on the left hub.
10. Press the spool down until the hub latch snaps into place.
11. Turn the left spool by hand and check to ensure that the ribbon tracks correctly in the ribbon path and around the ribbon guides.
12. Close the forms thickness lever.
13. Continue with the next procedure to load paper in the printer.

Load The Paper

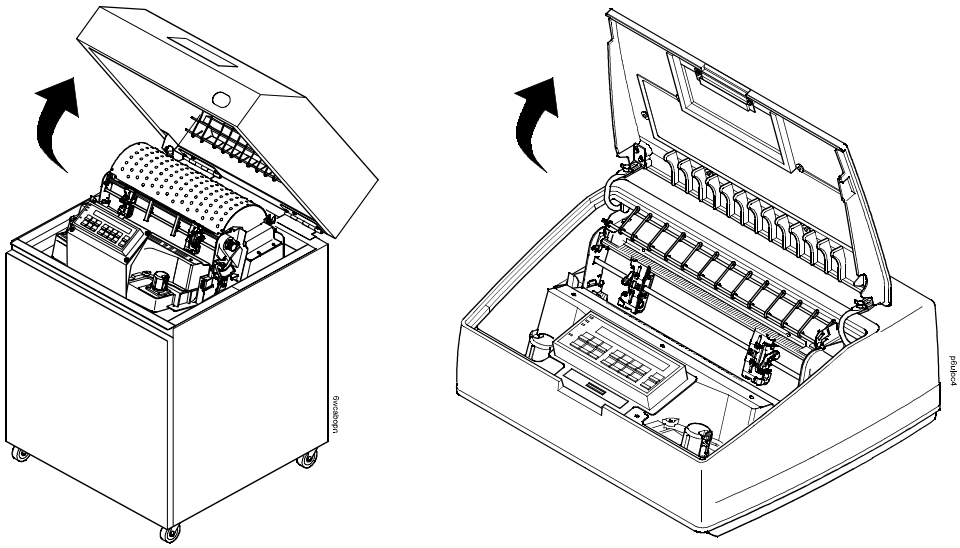


Figure 36. Opening the Printer Cover

1. Open the printer cover. See Figure 36.

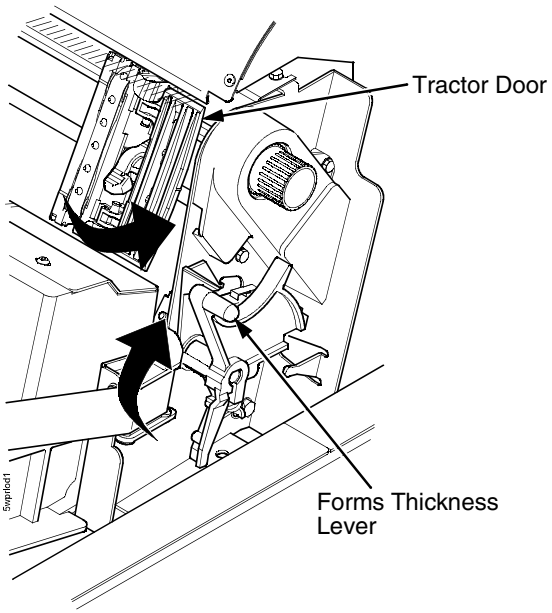


Figure 37. Forms Thickness Lever

2. Raise the forms thickness lever as far as it will go. See Figure 37.
3. Open the tractor doors. See Figure 37.

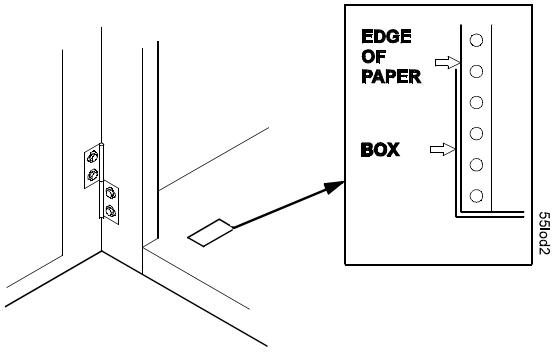


Figure 38. Paper Supply Label Location (Cabinet Models Only)

4. Prepare the paper supply:

- Cabinet models: Open the front door of the printer cabinet. Place the paper supply inside the printer, on the floor of the cabinet. Align the paper supply with the front label on the floor of the printer. Ensure that the paper pulls freely from the box. See Figure 38.
- Pedestal models: Place the paper supply on the floor in front of the printer, or on the optional paper shelf, if attached. Ensure that the paper pulls freely from the box.

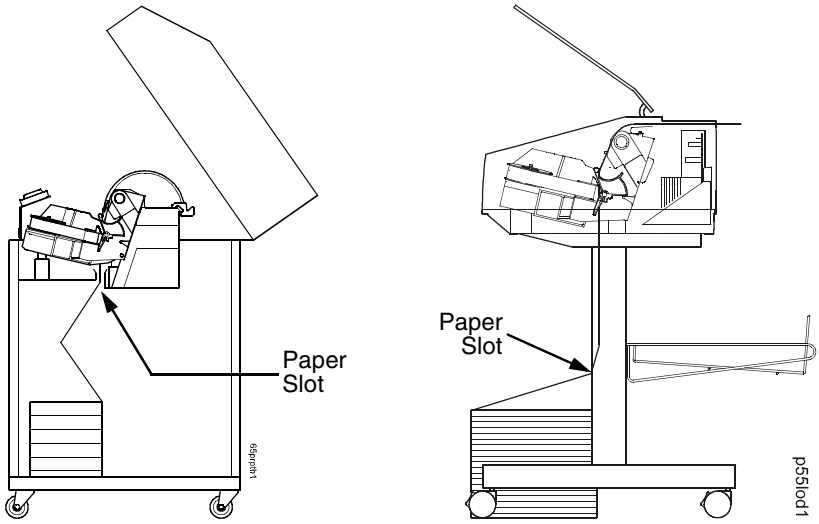


Figure 39. Feeding the Paper

5. Feed the paper up through the paper slot. On pedestal models, be sure the paper feeds between the two wire guides. Hold the paper in place with one hand (to prevent it from slipping down through the paper slot) while pulling it through from above with your other hand. See Figure 39.

NOTE: For the pedestal model, this procedure shows loading paper when using the rear paper exit. For information on loading paper using the top paper exit, see the *IBM 6400-D Series Operator's Guide.*

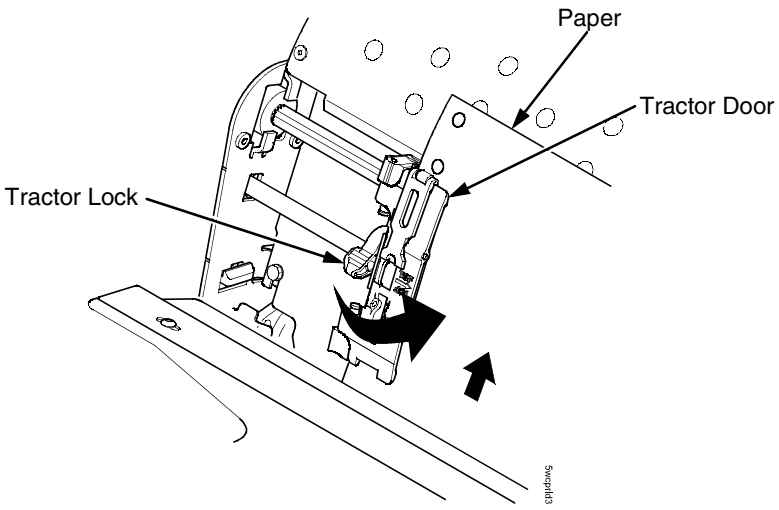


Figure 40. The Left Tractor

6. Pull the paper above and behind the ribbon mask, which is a silver-colored metal strip. Refer to the ribbon path diagram on the shuttle cover. Load the paper onto the left tractor sprockets and close the left tractor door. See Figure 40.

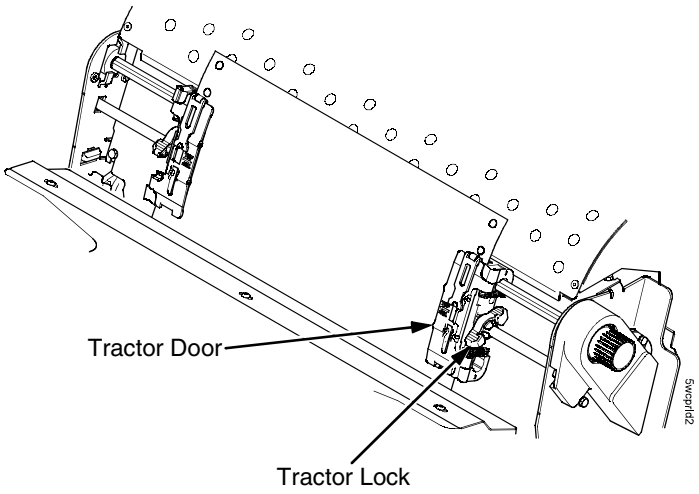


Figure 41. The Right Tractor

7. Load the paper onto the right tractor and close the right tractor door. Slide the right tractor horizontally to remove any paper slack, then lock it in place. See Figure 41.

ATTENTION

To avoid damage to the printer caused by printing on the platen, always align the edge of the left tractor door with the number “1” on the paper scale.

NOTE: Thin Paper = single sheet
Medium Paper = two-part form
Thick Paper = six-part form

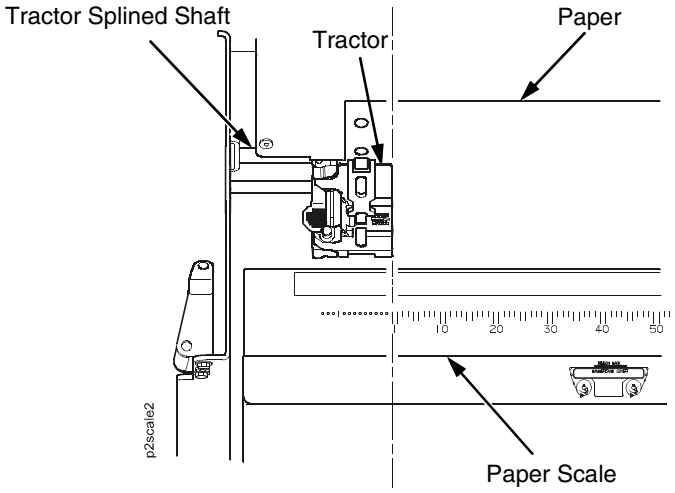


Figure 42. Aligning the Paper

8. If adjustment is necessary:
   a. Unlock the left tractor.
   b. Slide the tractor until it is directly to the left of the number “1” on the paper scale and lock it. You can also use the paper scale to count columns.

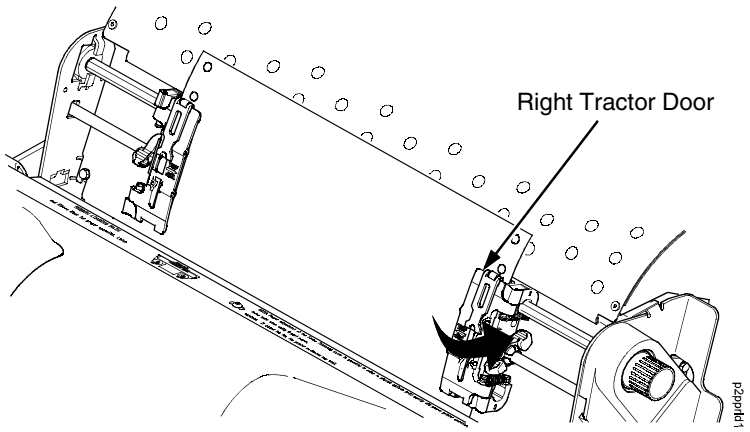


Figure 43. Paper Loaded onto the Right Tractor Sprockets

9. Unlock the right tractor.
10. Load the paper onto the right tractor sprockets.
11. Close the tractor door.
12. Make sure the leading edge of the first sheet of paper is parallel to the tractor splined shaft. If the paper is misaligned, reload it onto the tractor sprockets until its edge is parallel to the splined shaft.
13. Slide the right tractor to remove the paper slack or to adjust for various paper widths.
14. Lock the tractor.

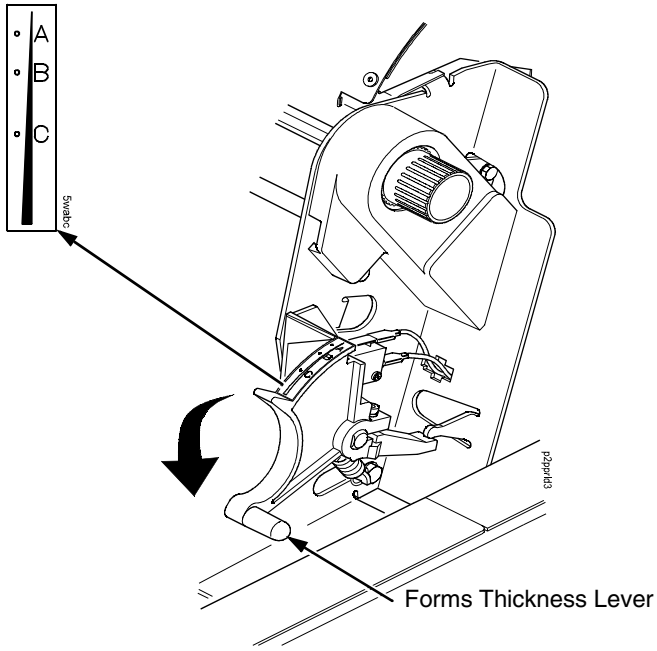


Figure 44. The Forms Thickness Scale

15. Turn the vertical position knob to feed the paper up into the paper guide assembly.
16. Lower the forms thickness lever, and set it to match the paper thickness. (The A-B-C scale corresponds approximately to 1-, 3-, and 6-part paper thickness.)

NOTE: Do not set the forms thickness lever too tightly; excessive friction can cause paper jams, ribbon jams (with potential for ribbon damage), smeared ink, or wavy print.

17. Press STOP to remove the “LOAD PAPER” fault message from the display.
18. Press FORM FEED several times to make sure the paper feeds properly beyond the tractors and over the lower paper guide. Feed sufficient paper to ensure the paper stacks correctly.
19. Close the printer cover.
20. Close the cabinet door.
21. Press START to place the printer in online mode and resume printing.

NOTE: For cabinet models with the power paper stacker installed, go to “Power Paper Stacker Option” in the next section. For all other cabinet models, go to “Set The Top-Of-Form” on page 61..

Power Paper Stacker Option

This section explains how to set up and use the optional power paper stacker. The power stacker mechanically directs the paper from the printer to the paper stacker.

Power Paper Stacker Component Locations

Familiarize yourself with the names and locations of the components shown in the following illustration before operating the power paper stacker.

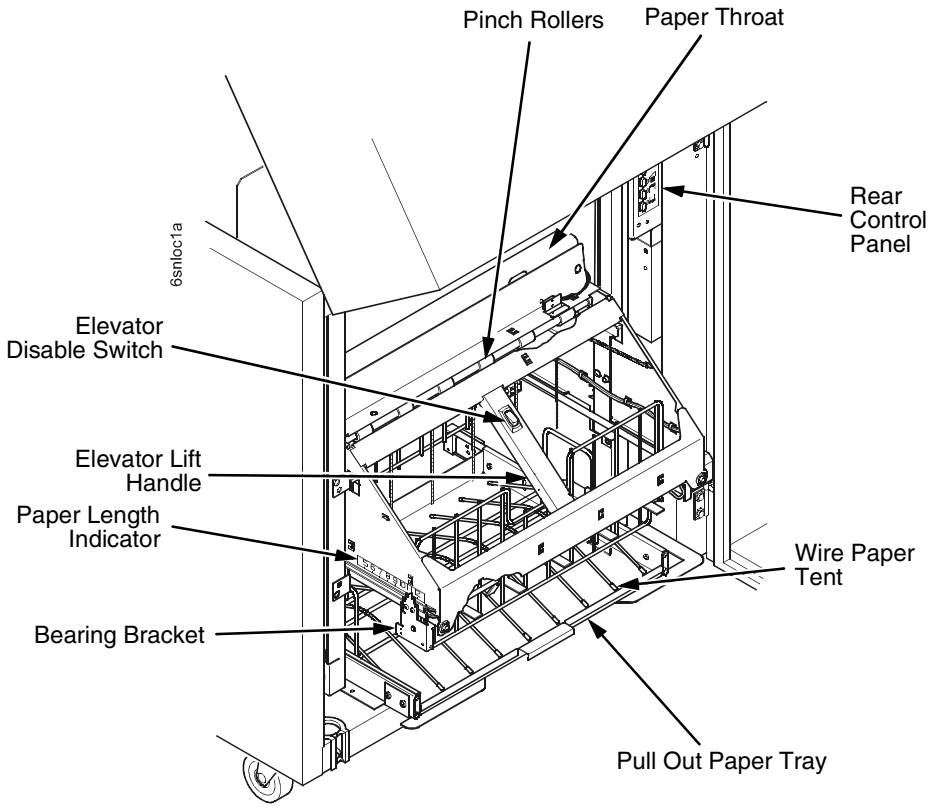


Figure 45. View of the Power Paper Stacker Component Locations

Setting Up The Power Paper Stacker

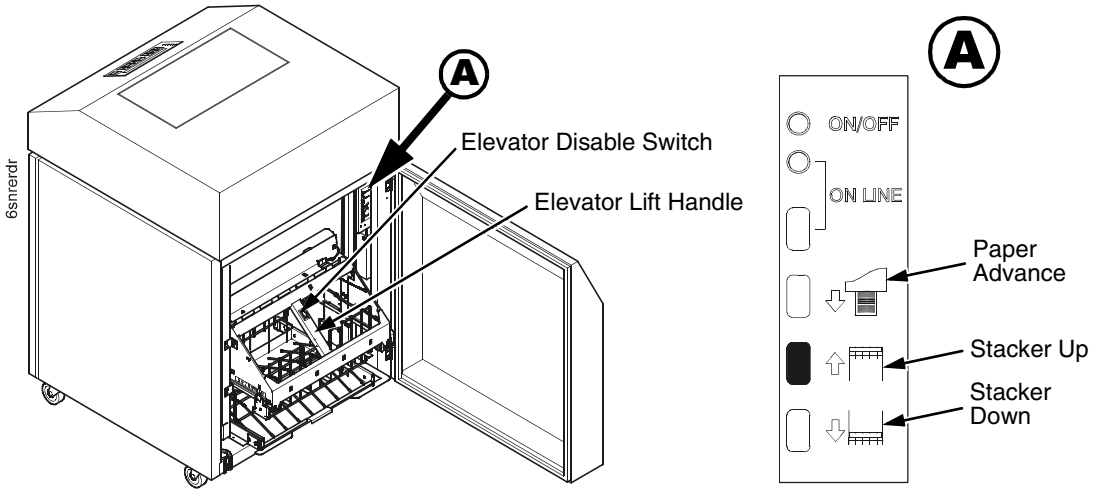


Figure 46. Cabinet Model Rear Door Open Showing Rear Operator Panel

1. Turn the printer ON.
2. Using the rear operator panel, press ONLINE to take the printer offline.
3. Grasp the elevator lift handle and press the elevator disable switch while raising the elevator to the top of its travel.

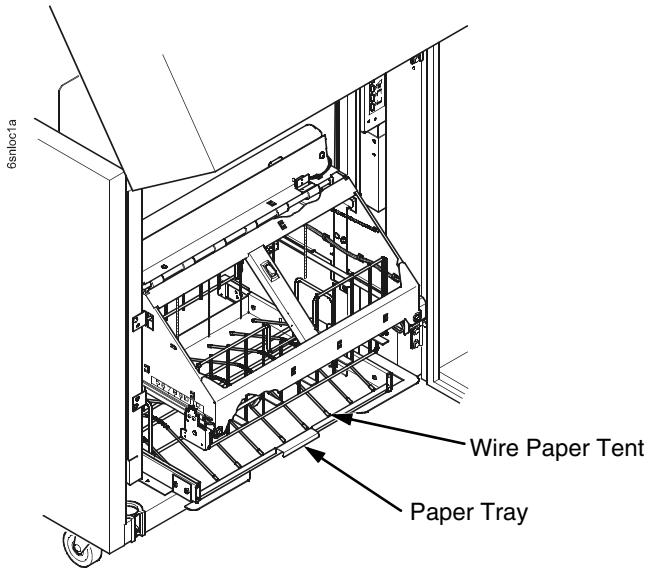


Figure 47. Rear View of Cabinet Model Showing Power Stacker Components

4. Make sure the wire paper tent is fitted in the pull out paper tray in the base of the stacker.

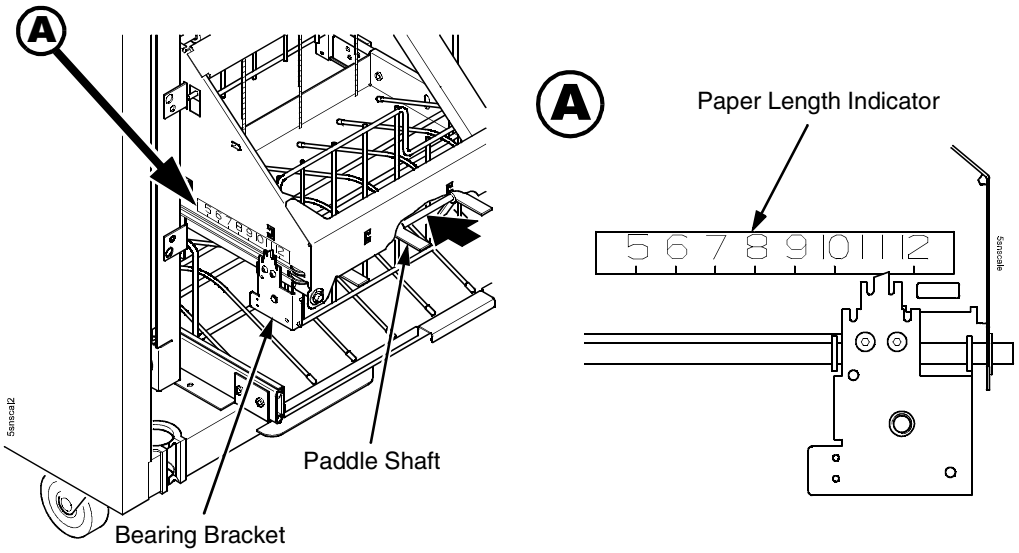


Figure 48. Interior Side View of the Cabinet Model Showing the Paper Length Indicator

5. Set the desired paper length (5-12 inch range), as follows:

   Grasping the paddle shaft, push or pull toward the front or the rear of the printer, setting the desired paper length by aligning indicator notch on the bearing bracket with the paper length indicator.

6. Press Stacker Down.

Loading And Starting The Power Paper Stacker

1. Using the rear operator panel, press the PAPER ADVANCE key and hand feed the paper until paper reaches the wire tent and there is an excess of 3 to 5 pages. Be certain the paper passes through the paper stacker throat smoothly.
2. Stack the 3-5 sheets of paper on top of the wire paper tent, making sure the paper lies with the natural folds.
3. On the printer's main operator panel, the printer displays "OFFLINE." If a message other than "OFFLINE" displays in the operator panel, refer to Chapter 6, "Routine Service and Diagnostics" on page 265.
4. Press the **START** key on the operator panel or the **ONLINE** key on the rear operator panel. "READY" displays on the LCD and the "ONLINE" on the rear operator panel is lit. The stacker frame returns to its proper position for printing.
5. Check to ensure paper is still centered between paper guides.
6. Close the rear cabinet door.

Checking The Paper Feed

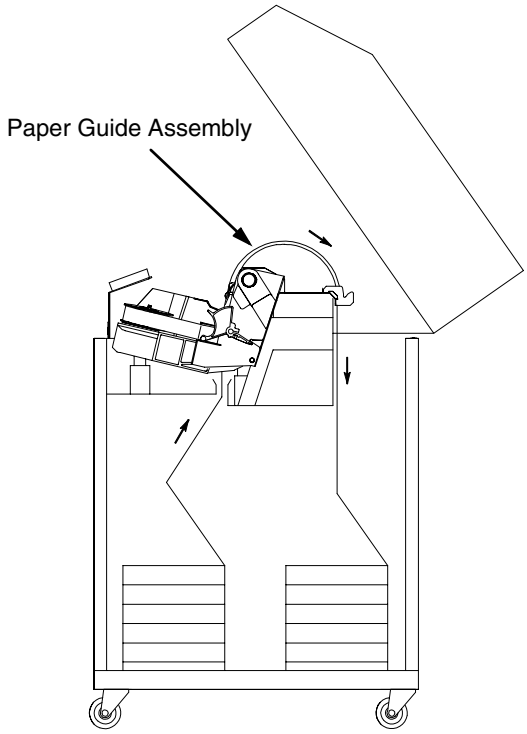


Figure 49. Checking the Paper Feed (Cabinet Models)

1. Power on the printer.
2. Cabinet models:

   Check that the paper feeds correctly. Press the **Form Feed** key several times to ensure that the paper feeds properly beyond the tractors and over the paper guide assembly. Ensure that the paper folds the same way in the stacking area as it does in the supply area. See Figure 49.

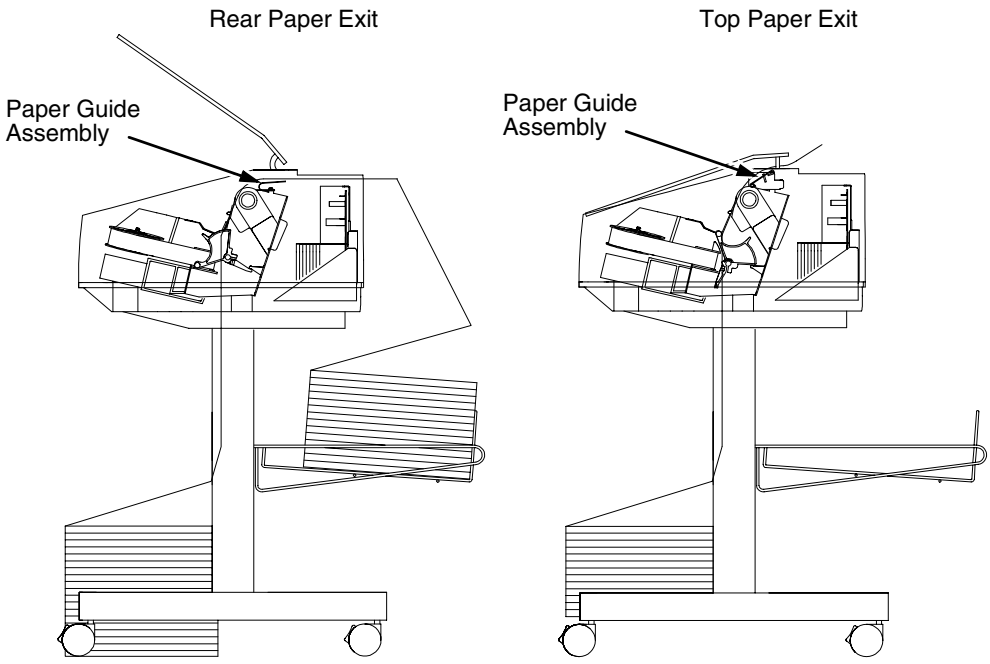


Figure 50. Checking the Paper Feed (Pedestal Models)

3. Pedestal models:

NOTE: See the *Operator's Guide* for instructions on switching between the two paper exit modes.

When using the top exit paper path, paper can not be stacked. Paper is intended to be removed after each print job is completed.

- For rear paper exit: Press the **Form Feed** key several times to ensure that the paper feeds properly beyond the tractors, over the paper guide assembly, and through the paper exit slot in the rear of the cabinet. Ensure that the paper folds the same way in the stacking area as it does in the supply area. See Figure 50.
- For top paper exit: Press the **Form Feed** key several times to ensure that the paper feeds properly beyond the tractors, over the paper guide assembly, and through the paper exit slot. See Figure 50.

4. Cabinet models: Close the cabinet front and rear doors, if the length of the form allows.
5. Cabinet and pedestal models: Continue with the next procedure to set the top-of-form.

Top-Of-Form

The printer must be told where you want the top of your form to be. This procedure must be performed the first time paper is introduced into the printer, as well as every time new paper is loaded.

Set The Top-Of-Form

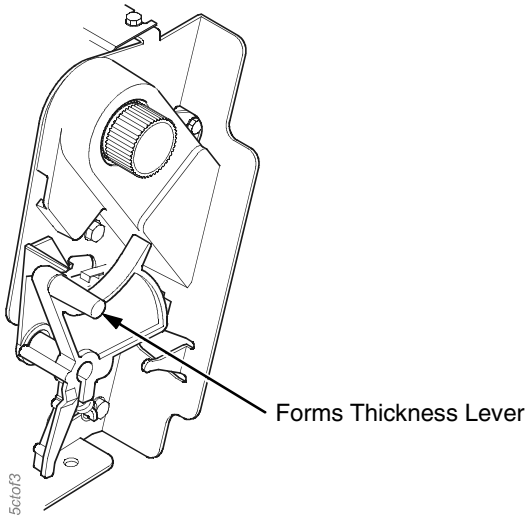


Figure 51. Raising the Forms Thickness Lever

1. Raise the forms thickness lever as far as it will go. The “CLOSE PLATEN” message will appear on the operator panel. Press any key on the operator panel to silence the alarm. See Figure 51.

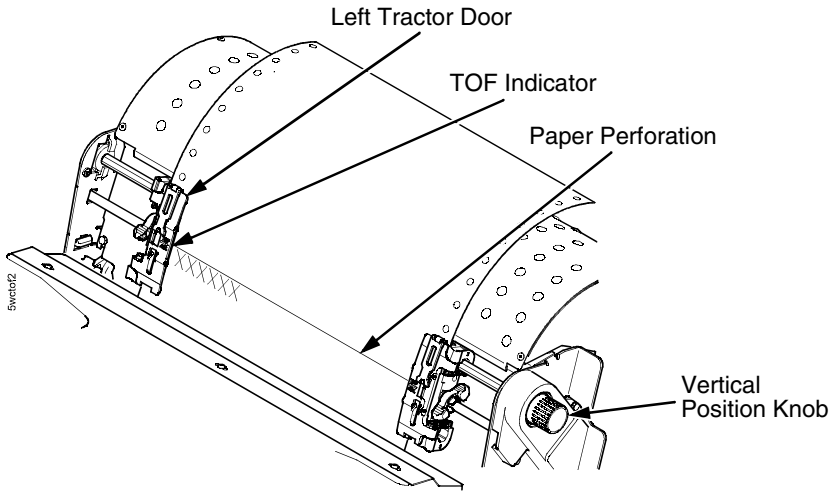


Figure 52. TOF Indicator

2. Locate the TOF indicator. It is the small tab located on the left tractor door. See Figure 52.
3. Turn the vertical position knob up or down to align the top of the first print line with the TOF indicator. See Figure 52.

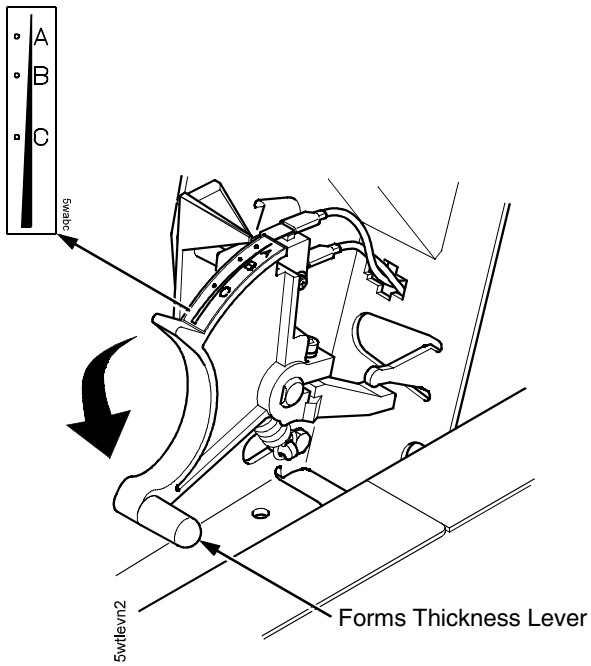


Figure 53. The Forms Thickness Scale

4. Lower the forms thickness lever. The CLOSE PLATEN fault clears automatically. Set it to match the paper thickness. If you are using single-part forms, set the forms thickness lever so that “A” is next to the indicator. Refer to the note on the shuttle cover. See Figure 53.

NOTE: Do not set the forms thickness lever too tightly; excessive friction can cause paper jams and ribbon jams with potential for ribbon damage, smeared ink, or wavy print.

5. Press **Set Top of Form**. The paper moves downward to the top-of-form print position.
6. Continue with the next procedure to test the printer.

Test The Printer

As an initial printer test, print the current configuration page. Go to Chapter 3, “Configuring The Printer” for instructions on printing the current configuration page.

On the configuration printout, examine the print quality of the characters. They should be fully formed and of uniform density. If text characters do not appear correctly formed or if the test does not run, contact your IBM Customer Service Representative.

The printer is now ready for configuration. Refer to Chapter 3, “Configuring The Printer” for more information.

3 *Configuring The Printer*

Overview

IMPORTANT

Configuration directly affects printer operation. Do not try to change the configuration of your printer until you are thoroughly familiar with the procedures in this chapter.

In order to print data, the printer must respond correctly to signals and commands received from the host computer. Configuration is the process of matching the printer operating characteristics to those of the host computer and to specific tasks, such as printing labels, or printing on different sizes of paper. The characteristics that define the printer response to signals and commands received from the host computer are called configuration parameters.

You can configure the printer by pressing operator panel keys or by sending control codes from the host computer. This chapter explains how to use the operator panel to change individual parameters and save them as a custom configuration.

Operator panel keys are described in the *IBM 6400-D Series Operator's Guide.*

Your programmer's reference manuals provide information about control codes.

The Configurations

A configuration consists of a group of parameters, such as line spacing and forms length. Your printer contains the following configurations:

- Four preloaded configurations that have been customized for printer setup.
- The factory default configuration. It can be loaded, but it cannot be altered. A list of all the parameters and their values begins on page 71.
- Four configurations that you can customize for unique print job requirements. The process of creating customized configurations is explained starting on page 82.

Active Versus Saved Configurations

When you change a parameter value, it is active as long as the printer is on or until it is changed again. This is true whether you use the operator panel or send a control code from the host. Parameter values defined by control codes override the active operator panel parameters when the printer is using any of the parallel or serial interfaces. For example, if you set the line spacing to 6 lpi with the operator panel, and application software later changes this to 8 lpi with a control code, the control code setting overrides the operator panel setting.

Using the operator panel, you can save the parameters as a customized configuration that is stored in non-volatile random access memory (NVRAM). A saved configuration is not lost when you power off the printer.

NOTE: Saved configurations are also referred to as “custom sets.”

There are no control codes that allow you to save a parameter in NVRAM. However, you can save a configuration defined partially by control codes and store it in NVRAM using the operator panel. You can also save configuration values using PTR_SETUP. See page 100.

The Configuration Main Menu

Figure 54 shows an overview of the printer configuration menus. The pages that follow describe how to enter program mode, print the current configuration, change configuration parameters, and save and load custom sets.

For specific configuration menu options and their descriptions, refer to Chapter 4, “Configuration Menus.”

NOTE: The menus that are displayed from the operator panel are determined by the installed features.

Each feature is shipped with a document that describes the feature in detail. For more information about these documents, see the “Related Documents” section that begins on page 12.

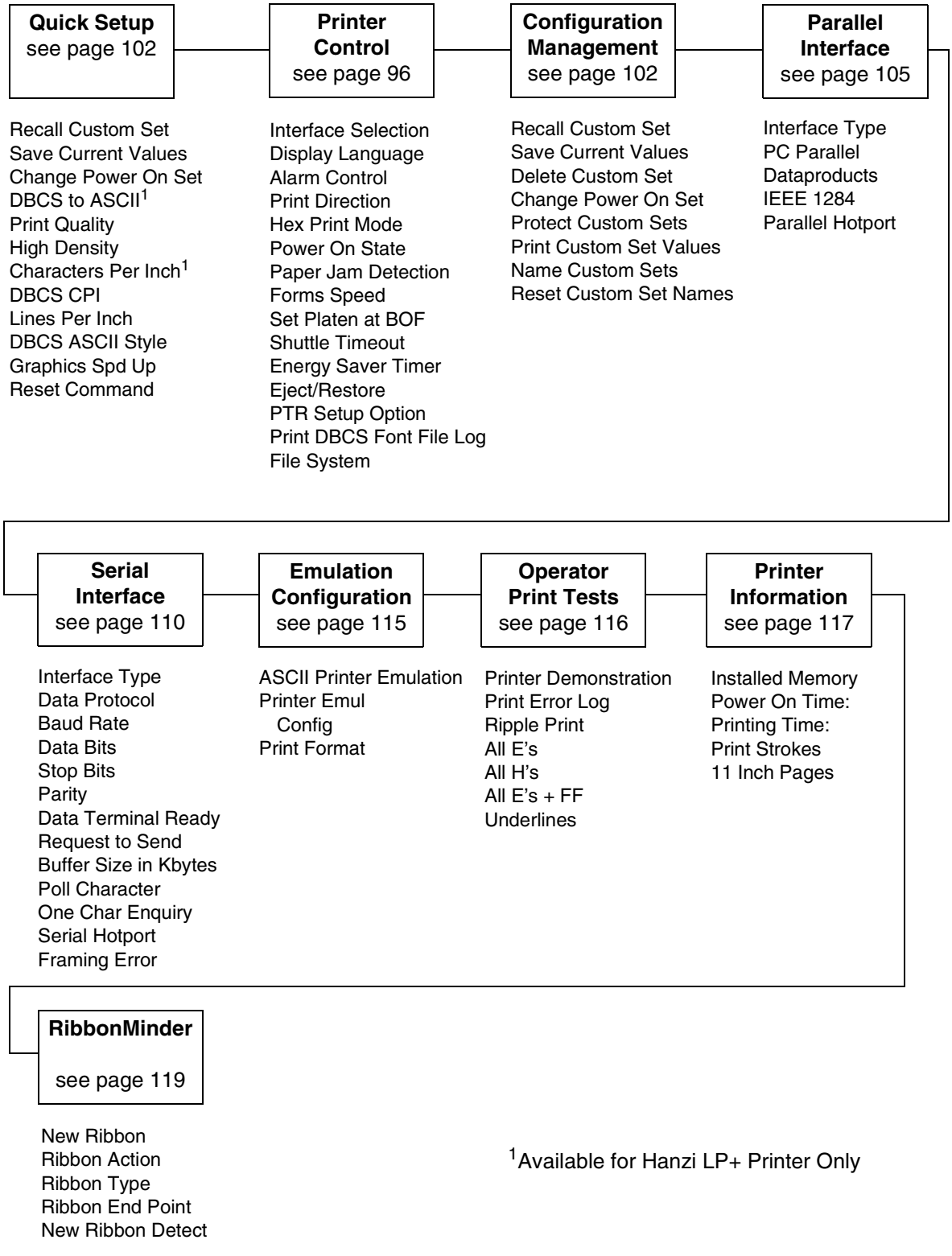


Figure 54. Configuration Main Menu

Using The Operator Panel

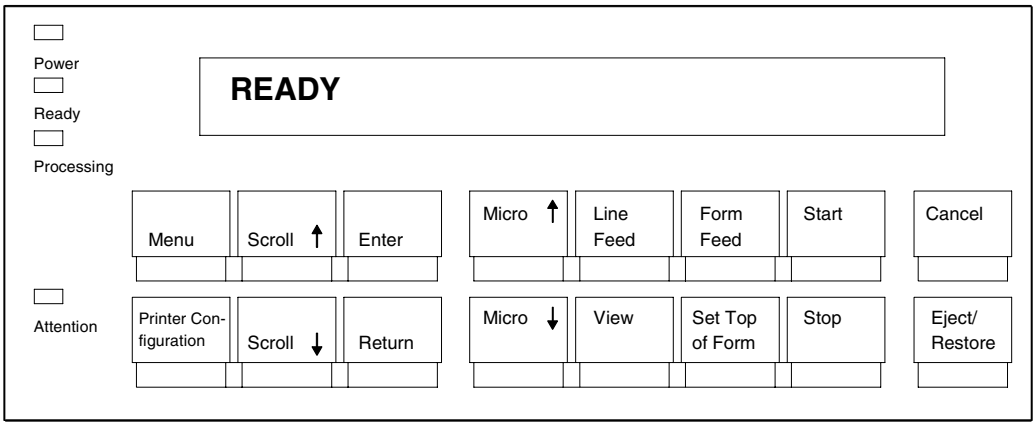


Figure 55. The Operator Panel

The operator panel is shown above. During the configuration process, you will use the **Scroll↑**, **Scroll↓**, **Enter**, and **Return** keys on the operator panel to access configuration settings and diagnostic tests via the configuration menus. As you access menus and options, menu names and option values appear on the operator panel message display (sometimes referred to as LCD, or Liquid Crystal Display).

This chapter provides numerous examples of how to use the operator panel keys and indicator message display to configure the printer. The operator panel key functions are described in detail in your *IBM 6400-D Series Operator's Guide.*

Program Mode

The printer is in Program mode whenever the configuration menus and option values are displayed on the operator panel message display. Program mode is either locked or unlocked. In order to select new configuration values, you must unlock Program mode. In order to prevent accidental changing of the configuration settings, you may lock Program mode.

Unlocking The Program Mode

Program mode must be unlocked in order to use the operator panel to change the configuration settings. When Program mode is unlocked, pressing the Enter key selects configuration values as the active values, that is, places them into printer NVRAM. An asterisk (*) after a displayed setting shows it is entered into memory.

Press the **Scroll↑ + Scroll↓** keys at the same time to unlock Program mode. The following message will appear briefly:

```
OPERATOR MENU
UNLOCKED
```

Locking The Program Mode

When Program mode is locked, you cannot use the operator panel to change the configuration settings. However, you can still select the configuration menus and view the current configuration settings.

Press the **Scroll↑ + Scroll↓** keys at the same time to lock Program mode. The following message will appear briefly:

```
OPERATOR MENU
LOCKED
```

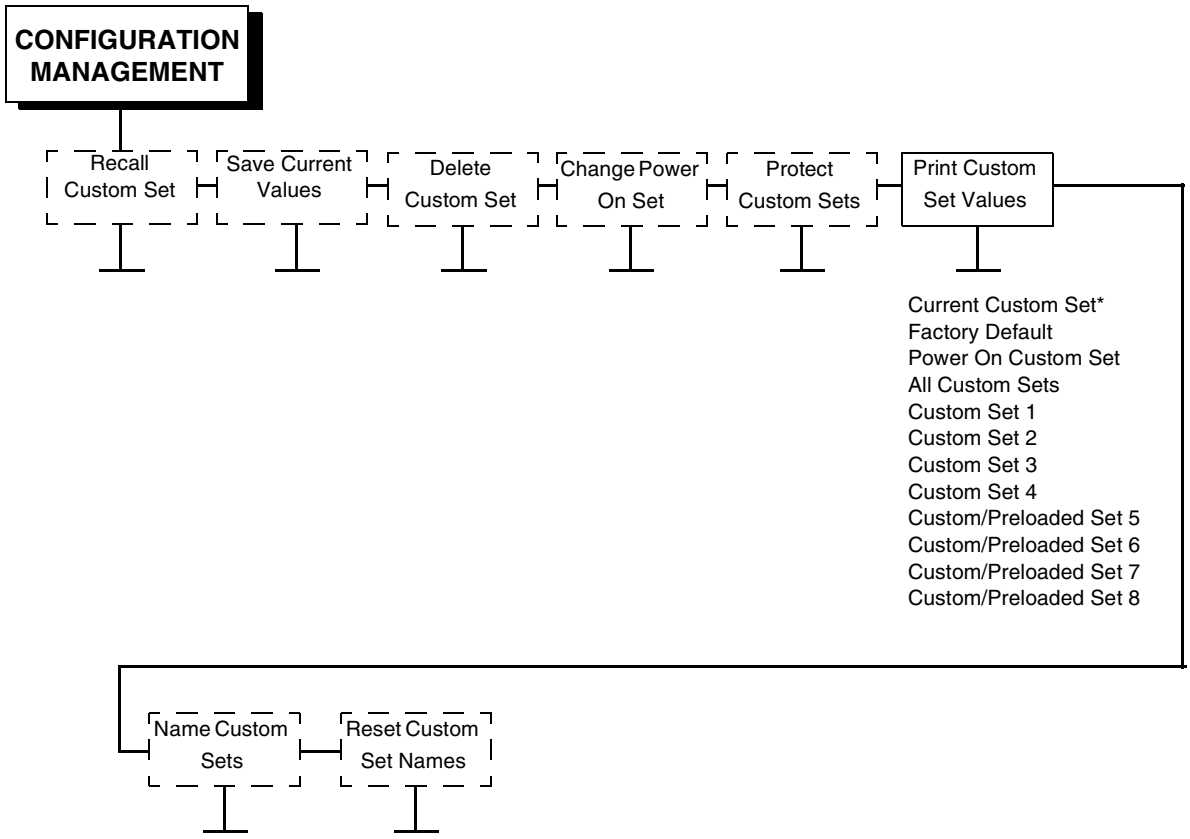
Entering Program Mode

To place the printer in Program mode, press the **Menu** key.

Printing The Current Configuration

Step	Key	LCD Result	Notes
1. Make sure the printer is on			
2. Press	Stop	NOT READY	The printer must be in NOT READY mode to print the configuration.
3.	Printer Con-figuration	PRESS START TO PRINT PRESS STOP TO EXIT	You are prompted to press the **Start** key before the configuration prints.
4.	Start	NOT READY	Indicates that the configuration has printed. Date and store the printout in a safe place. You may also want to label the printout (e.g. “Configuration for 2-up Labels”).
5.	Start	READY	The printer is READY for normal operation.

The second method for printing the current configuration, as well as several other configurations, is to use the Print Custom Set Values menu option, shown on the following page.



The Print Custom Set Values selection on the Configuration Management menu allows you to print any or all of the configurations shown above. The default setting, “Current Custom Set,” will print the same information as pressing the Printer Configuration key. The Current Custom Set is the Power On configuration until you begin modifying the printer configuration.

Custom sets 1 through 4 do not exist until you save configuration parameters to them. You must define and save a custom set before you can print it.

Custom/Preloaded Sets 5 through 8 contain configuration sets that assist with the installation and configuration of this printer.

The other options will only be useful once you have modified and saved the printer configuration parameter settings.

The Power On Custom Set is defined by the “Change Power On Set” option.

Custom Sets 1 through 8 are defined by the “Save Current Values” option.

These options are described in detail under the Configuration Management Menu description starting on page 102.

Factory Default Configuration Values

The factory default values are permanently stored as a configuration. They cannot be modified or erased. The parameters which display depend on which interface and emulation is installed.

Configuration

Below is a representative Hanzi printer factory default configuration. Your factory default configuration will depend on the features installed on your printer.

```
CURRENT CONFIGURATION
File Part Number (See Reference Number)
Reference Number XXXXXX
Hanzi LinePrinter+ GB Version x.xxx
DC              Vx.xxx XX-XXX-XX #XXXXXX
EC PPC HANZI    Vx.xxx XX-XXX-XX #XXXXXX
BOOT/CMX        Vx.xxx XX-XXX-XX #XXXXXX
SHUTTLE TYPE          2000S
SHUTTLE PHASE         45
FLASH                 12 MB
DRAM                  32 MB
SECURITY PAL          363167-001
CONFIGURATION CODE    FH3
QUICK SETUP
   RECALL CUSTOM SET                FACTORY DEFAULT
   SAVE CURRENT VALUES              CUSTOM SET 1
   CHANGE POWER ON SET              FACTORY DEFAULT
   DBCS TO ASCII                    DBCS MODE
   PRINT QUALITY                    NEAR LQ
   HIGH DENSITY                     DISABLE
   CHARACTERS PER INCH              10.0 CHARACTERS PER
                                    IN
   DBCS CPI                         6.7 CPI
   LINES PER INCH                   6.0 LINES PER INCH
   DBCS ASCII STYLE                 NORMAL
   GRAPHICS SPD UP                  NORMAL
   RESET COMMAND                    LOAD FACTORY
```

PRINTER CONTROL	
INTERFACE SELECTION	PARALLEL
DISPLAY LANGUAGE	ENGLISH
ALARM CONTROL	ALARM ENABLED
PRINT DIRECTION	BIDIRECTIONAL
HEX PRINT MODE	DISABLE
POWER ON STATE	READY
PAPER JAM DECTECTION	ENABLE
FORMS SPEED	NORMAL SPEED
SET PLATEN AT BOF	DISABLE
SHUTTLE TIMEOUT	5 SECONDS
ENERGY SAVER TIMER	15 MINUTES
EJECT/RESTORE	STANDARD
PTR SETUP OPTION	
SETUP PARSE	DISABLE
SETUP SFCC	21h
PRINT DBCS FONT FILE LOG	
FILE SYSTEM	
OVERWRITE FILES	ENABLE
VIEW FILE LIST	
VERSION	66 BYTES
NETWORK.DAT	107 BYTES
NETEMB.DAT	107 BYTES
NETWLAN.DAT	107 BYTES
PTXLOGO.GIF	1210 BYTES
362974.EC1	524544 BYTES
ETHDLOAD	789194 BYTES
WLANLOAD	910776 BYTES
OPTIMIZE&REBOOT	
PRINT FILE LIST	
DBCS DOWNLOAD	
SAVE TO FLASH	
DELETE DL.FONT	
CONFIGURATION MANAGEMENT	
RECALL CUSTOM SET	FACTORY DEFAULT
SAVE CURRENT VALUES	CUSTOM SET 1
DELETE CUSTOM SET	CUSTOM SET 1
CHANGE POWER ON SET	FACTORY DEFAULT
PROTECT CUSTOM SETS	DISABLE
PRINT CUSTOM SET VALUES	CURRENT CUSTOM SET

NAME CUSTOM SETS	
CUSTOM SET 1	
CUSTOM SET 2	
CUSTOM SET 3	
CUSTOM SET 4	
CUSTOM/PRELOADED SET 5	
CUSTOM/PRELOADED SET 6	
CUSTOM/PRELOADED SET 7	
CUSTOM/PRELOADED SET 8	
RESET CUSTOM SET NAMES	CUSTOM SET 1
PARALLEL INTERFACE	
INTERFACE TYPE	IEEE 1284
PC PARALLEL	
DATA BITS 8	ENABLE
DATA POLARITY	STANDARD
STROBE POLARITY	STANDARD
RESPONSE POLARITY	STANDARD
BUSY ON STROBE	ENABLE
LATCH DATA ON	LEADING EDGE
PRIME SIGNAL	ENABLE
TOP ACTION AT PRIME SIGNAL	FORM FEED AT RESET
BUFFER SIZE IN KBYTES	64
AUTO TRICKLE	1/4 SEC
TRICKLE TIME	
DATAPRODUCTS	
DATA BIT 8	ENABLE
PI IGNORED	ENABLE
DATA POLARITY	STANDARD
DATA REQUEST POLARITY	STANDARD
STROBE POLARITY	STANDARD
BUFFER SIZE IN KBYTES	64
AUTO TRICKLE	DISABLE
TRICKLE TIME	1/4 SEC
IEEE 1284	
BUFFER SIZE IN KBYTES	64
AUTO TRICKLE	DISABLE
TRICKLE TIME	1/4 SEC

PARALLEL HOTPORT	
TRICKLE TIME	1/4 SEC
TIMEOUT	10 SEC.
REPORT STATUS	DISABLE
SERIAL INTERFACE	
INTERFACE TYPE	RS 232
DATA PROTOCOL	XON/XOFF
BAUD RATE	9600 BAUD
DATA BITS	8
STOP BITS	1
PARITY	NONE
DATA TERMINAL READY	READY/BUFFER NOT FULL
REQUEST TO SEND	TRUE
BUFFER SIZE IN KBYTES	64
POLL CHARACTER	00 HEX
ONE CHAR ENQUIRY	DISABLE
SERIAL HOTPORT	
TRICKLE TIME	1/4 SEC
TIMEOUT	10 SEC.
REPORT STATUS	DISABLE
FRAMING ERRORS	ENABLE
EMULATION CONFIGURATION	
ASCII PRINTER EMULATION	LQ1600K EMULATION
PRINTER EMUL CONFIG	
LQ1600K	
CHARACTER SETS	EPSON SET
EPSON PRINT LANGUAGE	ASCII (USA)
DEFINE CR CODE	CR = CR
AUTO LF	ENABLE
DEFINE LF CODE	LF = CR + LF
PRINTER SELECT	DISABLE
20 CPI CONDENSED	ENABLE
ALTERNATE SET 80-9F	PRINTABLE
CURRENCY SIGN	RMB SELECT
AR3240 COMPAT.	DISABLE

PRINT FORMAT		
	CHARACTERS PER INCH	10.0 CHARACTERS PER IN
	LINES PER INCH	6.0 LINES PER INCH
	DBCS CPI	6.7 CPI
	FORMS WIDTH	
	FORMS WIDTH IN INCHES	13.6 INCHES
	FORMS WIDTH IN MM	345.4 MM
	FORMS WIDTH IN CHARACTERS	136 CHARACTERS
	FORMS LENGTH	
	FORMS LENGTH IN INCHES	11.0 INCHES
	FORMS LENGTH IN MM	279.4 MM
	FORMS LENGTH IN LINES	66 LINES
	ADDRESS TABLE SELECT	GB18030
	PRINT QUALTITY	NEAR LQ
	HIGH DENSITY	DISABLE
	GRAPHICS SPD UP	NORMAL
	PRINT CHARACTER TABLE	
	PRINT ATTRIBUTES	
	PROPORTIONAL SPACING	DISABLE
	ITALIC PRINT	DISABLE
	SLASHED ZERO	DISABLE
	DBCS TO ASCII	DBCS MODE
	DBCS ASCII STYLE	NORMAL
	COMPRESSED MODE	DISABLE
	DBCS COMPRESSED	DISABLE
	MARGINS	
	LEFT MARGIN	0 CHARACTERS
	RIGHT MARGIN	0 CHARACTERS
	BOTTOM MARGIN	0 LINES
	PERFORATION SKIP	DISABLE
	RESET COMMAND	LOAD FACTORY
	HOST COMMAND	IGNORE UNIDIRECTIONAL
	ERROR HANDLING	
	ERROR:ILLEGAL CODE POINT	NORMAL
OPERATOR PRINT TESTS		PRINTER DEMONSTRATION

PRINTER INFORMATION	
INSTALLED MEMORY	32 MB
POWER ON TIME:	XXX.XX HOURS
PRINTING TIME:	XX HOURS
PRINT STROLES	XXXXXX
11 INCH PAGES	XXXX
RIBBONMINDER	
NEW RIBBON	
RIBBON ACTION	DISABLE
RIBBON TYPE	PREMIUM 30
RIBBON END POINT	NORMAL
NEW RIB. DETECT	DISABLE

IBM Printer Configuration

Below is a representation of Hangul's printer factory default configuration. Your factory default configuration will depend on the features installed in your printer.

```
FACTORY CONFIGURATION


File Part Number (See Reference Number)
Reference Number xxxxxx
Hangul LinePrinter+ Version 1.00A
DC              Vx.xxx   31-Oct-03      #xxxxxx
EC PPC HANZI    Vx.xxx   26-Sep-03      #xxxxxx
BOOT/PPC        Vx.xxx   15-Jul-03      #xxxxxx
FLASH                    16 MB
DRAM                     32 MB
SECURITY PAL             363259-001
CONFIGURATION CODE       FH3
QUICK SETUP
   RECALL CUSTOM SET                    FACTORY DEFAULT
   SAVE CURRENT VALUES                  CUSTOM SET 1
   CHANGE POWER ON SET                  FACTORY DEFAULT
   PRINT QUALITY                        LQ
   HIGH DENSITY                         DISABLE
   DBCS CPI                             6.0 CPI
   LINES PER INCH                       6.0 LINES PER INCH
   DBCS ASCII STYLE                     NORMAL
   GRAPHICS SPD UP                      NORMAL
   RESET COMMAND                        LOAD FACTORY
PRINTER CONTROL
   INTERFACE SELECTION
   DISPLAY LANGUAGE                     ENGLISH
   ALARM CONTROL                        ALARM ENABLED
   PRINT DIRECTION                      BIDIRECTIONAL
   HEX PRINT MODE                       DISABLE
   POWER ON STATE                       READY
   PAPER JAM DETECTION                  ENABLE
   FORMS SPEED                          NORMAL SPEED
   SET PLATEN AT BOF                    DISABLE
   SHUTTLE TIMEOUT                      5 SECONDS
   ENERGY SAVER TIMER                   15 MINUTES
   EJECT/RESTORE                        STANDARD
   PTR SETUP OPTION
```

SETUP PARSE	DISABLE
SETUP SFCC	21h
PRINT DBCS FONT FILE LOG	
FILE SYSTEM	
OVERWRITE FILES	ENABLE
VIEW FILE LIST	
VERSION	66 BYTES
NETWORK.DAT	107 BYTES
NETEMB.DAT	107 BYTES
NETWLAN.DAT	107 BYTES
PTXLOGO.GIF	1210 BYTES
362974.EC1	524544 BYTES
ETHDLOAD	789194 BYTES
CSTFILES.ALL	272 BYTES
WLANLOAD	910776 BYTES
OPTIMIZE&REBOOT	
PRINT FILE LIST	
CONFIGURATION MANAGEMENT	FACTORY DEFAULT
RECALL CUSTOM SET	CUSTOM SET 1
SAVE CURRENT VALUES	CUSTOM SET 1
DELETE CUSTOM SET	FACTORY DEFAULT
CHANGE POWER ON SET	DISABLE
PROTECT CUSTOM SETS	CURRENT CUSTOM SET
PRINT CUSTOM SET VALUES	
NAME CUSTOM SETS	
CUSTOM SET 1	
CUSTOM SET 2	
CUSTOM SET 3	
CUSTOM SET 4	
CUSTOM/PRELOADED SET 5	
CUSTOM/PRELOADED SET 6	
CUSTOM/PRELOADED SET 7	
CUSTOM/PRELOADED SET 8	
RESET CUSTOM SET NAMES	CUSTOM SET 1
PARALLEL INTERFACE	
INTERFACE TYPE	IEEE 1284
PC PARALLE	
DATA BIT 8	ENABLE
DATA POLARITY	STANDARD
STROBE POLARITY	STANDARD

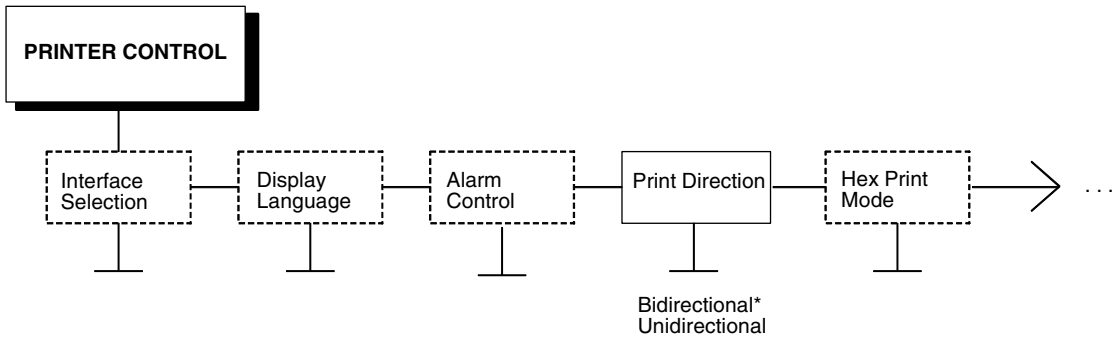
RESPONSE POLARITY	STANDARD
BUSY ON STROBE	ENABLE
LATCH DATA ON	LEADING EDGE
PRIME SIGNAL	ENABLE
TOF ACTION AT PRIME SIGNAL	FORM FEED AT RESET
BUFFER SIZE IN KBYTES	64
AUTO TRICKLE	DISABLE
TRICKLE TIME	1/4 SEC
DATAPRODUCTS	
DATA BIT 8	ENABLE
PI IGNORED	ENABLE
DATA POLARITY	STANDARD
DATA REQUEST POLARITY	STANDARD
STROBE POLARITY	STANDARD
BUFFER SIZE IN KBYTES	64
AUTO TRICKLE	DISABLE
TRICKLE TIME	1/4 SEC
IEEE 1284	
BUFFER SIZE IN KBYTES	64
AUTO TRICKLE	DISABLE
TRICKLE TIME	1/4 SEC
PARALLEL HOTPORT	
TRICKLE TIME	1/4 SEC
TIMEOUT	10 SEC.
REPORT STATUS	DISABLE
SERIAL INTERFACE	
INTERFACE TYPE	RS 232
DATA PROTOCOL	XON/XOFF
BAUD RATE	9600 BAUD
DATA BITS	8
STOP BITS	1
PARITY	NONE
DATA TERMINAL READY	READY/BUFFER NOT FULL
REQUEST TO SEND	TRUE
BUFFER SIZE IN KBYTES	64
POLL CHARACTER	00 HEX
ONE CHAR ENQUIRY	DISABLE

SERIAL HOTPORT	
TRICKLE TIME	1/4 SEC
TIMEOUT	10 SEC.
REPORT STATUS	DISABLE
FRAMING ERRORS	ENABLE
EMULATION CONFIGURATION	
ASCII PRINTER EMULATION	KS
PRINTER EMUL CONFIG	
KS	
DEFINE CR CODE	CR = CR
AUTO LF	ENABLE
DEFINE LF CODE	LF = CR + LF
PRINTER SELECT	DISABLE
ALTERNATE SET 80-9F	CONTROL CODE
EMULATION EXTEND	DISABLE
KSSM	
CHARACTER SETS	0437 PC CHARACTER SET
DEFINE CR CODE	CR = CR
AUTO LF	ENABLE
DEFINE LF CODE	LF = CR + LF
PRINTER SELECT	DISABLE
20 CPI CONDENSED	ENABLE
ALTERNATE SET 80-9F	CONTROL CODE
PRINT FORMAT	
CHARACTERS PER INCH	10.0 CHARACTERS PER IN
LINES PER INCH	6.0 LINES PER INCH
DBCS CPI	6.0 CPI
FORMS WIDTH	
FORMS WIDTH IN INCHES	13.6 INCHES
FORMS WIDTH IN MM	345.4 INCHES
FORMS WIDTH IN CHARACTERS	136 CHARACTERS
FORMS LENGTH	
FORMS LENGTH IN INCHES	11.0 INCHES
FORMS LENGTH IN MM	279.4 MM
FORMS LENGTH IN LINES	66 LINES
ADDRESS TABLE SELECT	KSC5601
PRINT QUALITY	LQ

HIGH DENSITY	DISABLE
GRAPHICS SPD UP	NORMAL
PRINT CHARACTER TABLE	
PRINT ATTRIBUTES	
ITALIC PRINT	DISABLE
SLASHED ZERO	DISABLE
DBCS ASCII STYLE	NORMAL
MARGINS	
LEFT MARGIN	0 CHARACTERS
RIGHT MARGIN	0 CHARACTERS
BOTTOM MARGIN	0 LINES
PERFORATION SKIP	DISABLE
RESET COMMAND	LOAD FACTORY
ERROR HANDLING	
ERROR: ILLEGAL CODE POINT	NORMAL
OPERATOR PRINT TEST	PRINTER DEMONSTRATION
PRINTER INFORMATION	
INSTALLED MEMORY	32 MB
POWER ON TIME:	191.2 HOURS
PRINTING TIME:	1.5 HOURS
PRINT STROKES	1002049
11 INCH PAGES	1188
RIBBONMINDER	
NEW RIBBON	
RIBBON ACTION	DISABLE
RIBBON TYPE	PREMIUM 30
RIBBON END POINT	NORMAL
NEW RIBBON DETECT	DISABLE

IBM Printer Configuration

Changing Parameters



* = Factory Default

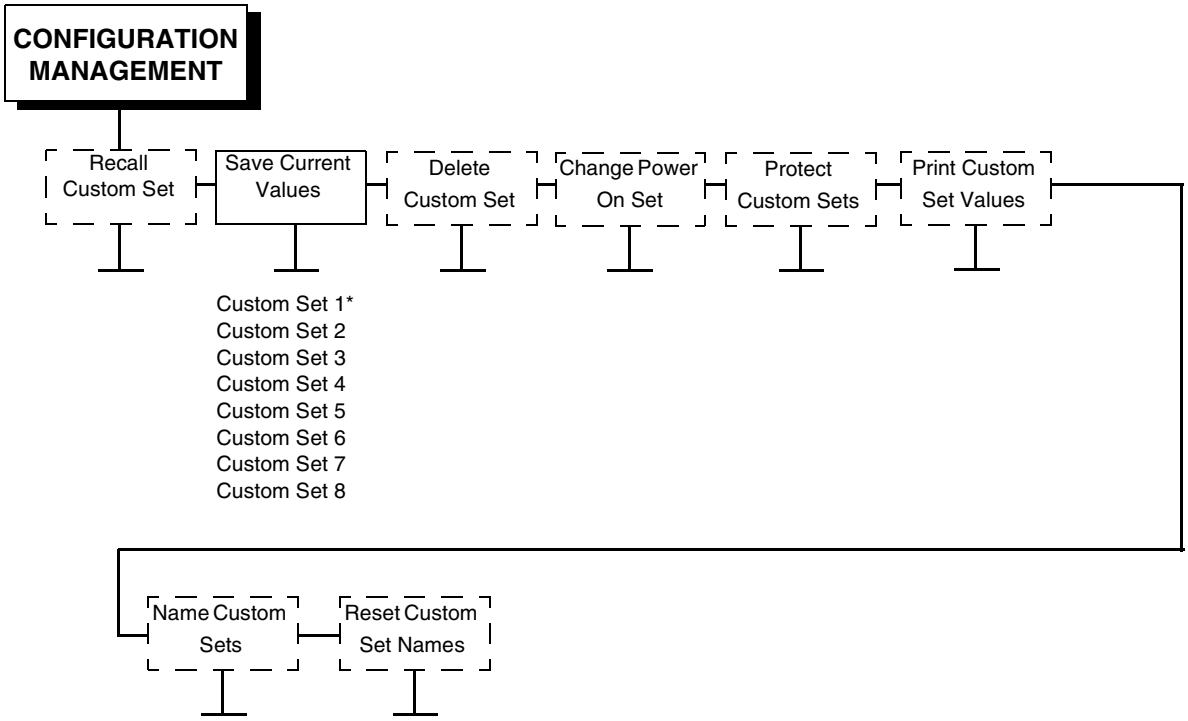
The following procedure shows you how to change a configuration setting. Changing the Print Direction from the factory default setting BIDIRECTIONAL to the setting UNIDIRECTIONAL is provided as an example. Print Direction is one of the Printer Control menu options. The procedure is similar for other configuration changes. Use these basic guidelines to navigate the configuration menus and change other parameters.

NOTE: You can press **Start** at any time to exit the configuration menu.

Step	Key	LCD Results	Notes
1.	Determine which parameters you want to change and what the new values will be. In this example, the value for the PRINT DIRECTION parameter will be changed from "BIDIRECTIONAL" to "UNIDIRECTIONAL."		
2.	Press Stop	NOT READY	Places the printer in NOT READY mode before entering the operator menus.
3.	Scroll↑ + Scroll↓	OPERATOR MENU UNLOCKED	Unlocks the Operator Menu, which allows you to make configuration changes.
4.	Menu	OPERATOR MENU PRINTER CONTROL	Displays the first Configuration Main Menu option, PRINTER CONTROL.
5.	Enter	PRINTER CONTROL INTERFACE SELECTION	Moves into the PRINTER CONTROL menu.

Step	Key	LCD Results	Notes
6.	Scroll↑ UNTIL	PRINTER CONTROL PRINT DIRECTION	Moves to the PRINT DIRECTION parameter.
7.	Enter	PRINT DIRECTION BIDIRECTIONAL*	Move into the PRINT DIRECTION menu. The asterisk (*) shows that this is the active value.
8.	Scroll↑	PRINT DIRECTION UNIDIRECTIONAL	Moves to the next available option, the UNIDIRECTIONAL option.
9.	Enter	PRINT DIRECTION UNIDIRECTIONAL*	Selects the displayed value. An asterisk (*) appears indicating that this choice is now the active value.
10. Continue this pattern to make all of the changes, using the information in this chapter.			
11. To save changes so that they will remain when the printer is reset or powered back on, see “Saving Your Configuration In A Custom Set” on page 84. If you want to use these values but not save them, continue to the next step.			
12.	Stop	NOT READY	Returns the printer to the NOT READY mode.
13.	Scroll↑ + Scroll↓	OPERATOR MENU LOCKED	Locks Program mode and the Operator Menu.
14.	Stop	READY	Places the printer in READY mode, prepared for normal operation.

Saving Your Configuration In A Custom Set



Once you have changed all of the necessary parameters, it is recommended you save them as a configuration that can be stored and loaded later for future use. You can save your configurations to meet different print job requirements.

The saved configurations (called custom sets) are stored in NVRAM—they will not be lost if you power off the printer.

Later, you can load one of the configurations for a specific print job. This eliminates the need to change settings, such as CPI and LPI, for each new job. See page 86 about loading configurations.

You may want to print records of your configurations (page 69) and store them in a safe place, such as inside the printer cabinet.

If you do not save your configuration before you power off the printer, all of the new parameter values that have not been saved to NVRAM will be erased. When you power the printer on again, the power-on configuration will load. If no configuration has been designated as the power-on configuration, the factory configuration will load.

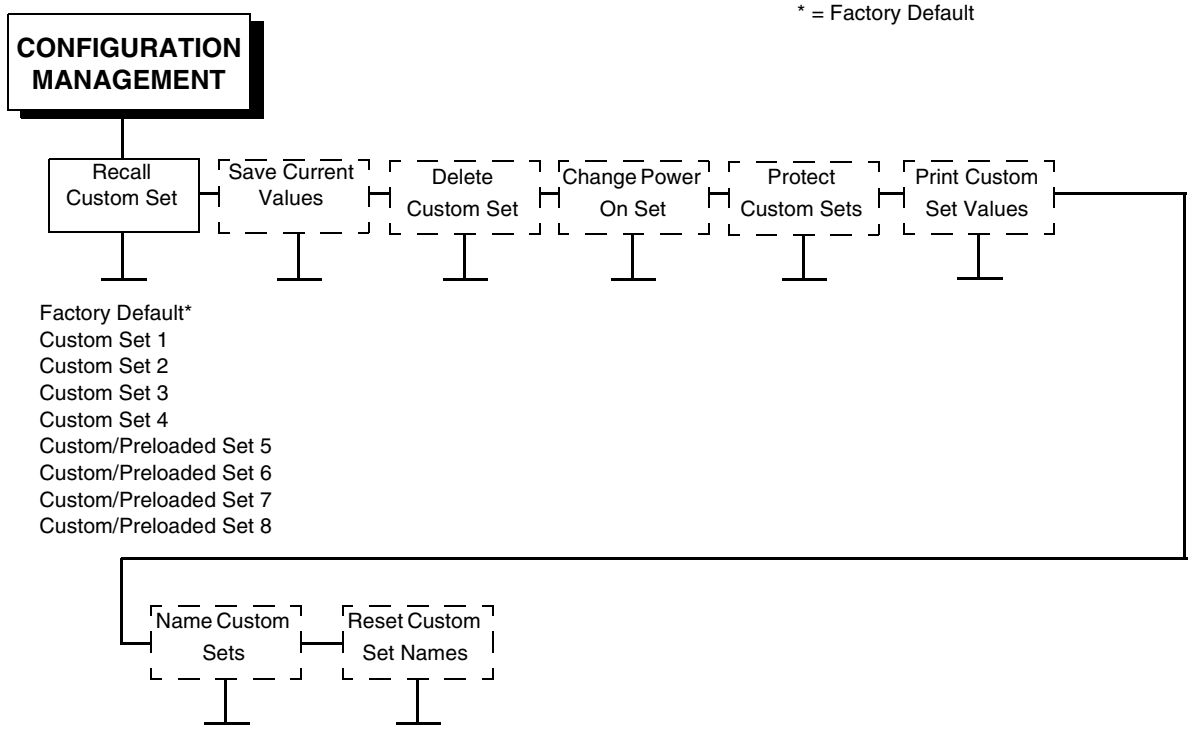
NOTE: To avoid overwriting an existing custom set, the Protect Custom Sets parameter must be set to ENABLE. See page 103 for details.

Step	Key	LCD Results	Notes
1. Press	Stop	NOT READY	Places the printer in NOT READY mode.
2.	Scroll↑ + Scroll↓	OPERATOR MENU UNLOCKED	Unlocks the Operator Menu, which allows you to make configuration changes.
3.	Menu	OPERATOR MENU QUICK SETUP	Displays the first Configuration Main Menu option, QUICK SETUP.
4.	Scroll↑ UNTIL	OPERATOR MENU CONFIGURATION MANAGEMENT	Moves to the Configuration Management menu option.
5.	Enter	CONFIGURATION MANAGEMENT RECALL CUSTOM SET	Selects the CONFIGURATION MANAGEMENT menu. The RECALL CUSTOM SET option appears.
6.	Scroll↑ UNTIL	CONFIGURATION MANAGEMENT SAVE CURRENT VALUES	Moves to the SAVE CURRENT VALUES option.
7.	Enter	SAVE CURRENT VALUES CUSTOM SET 1*	Selects the SAVE CURRENT VALUES menu.
8.	Scroll↑ UNTIL	SAVE CURRENT VALUES CUSTOM SET 2	Scrolls through the list of custom sets 1 - 8.
9.	Enter	SAVING CONFIGURATION	Selects the SAVE CURRENT VALUES option. The message “SAVING CONFIGURATION” appears briefly.
10.	Stop	NOT READY	Returns the printer to the NOT READY mode.

Step	Key	LCD Results	Notes
11.	Scroll↑ + Scroll↓	OPERATOR MENU LOCKED	Locks Program mode and the Operator Menu.
12.	Stop	READY	Places the printer in READY mode, prepared for normal operation.

13. It is recommended you make a printout of your current configuration, as described on page 69.

Loading Custom Sets Or Factory Default Values

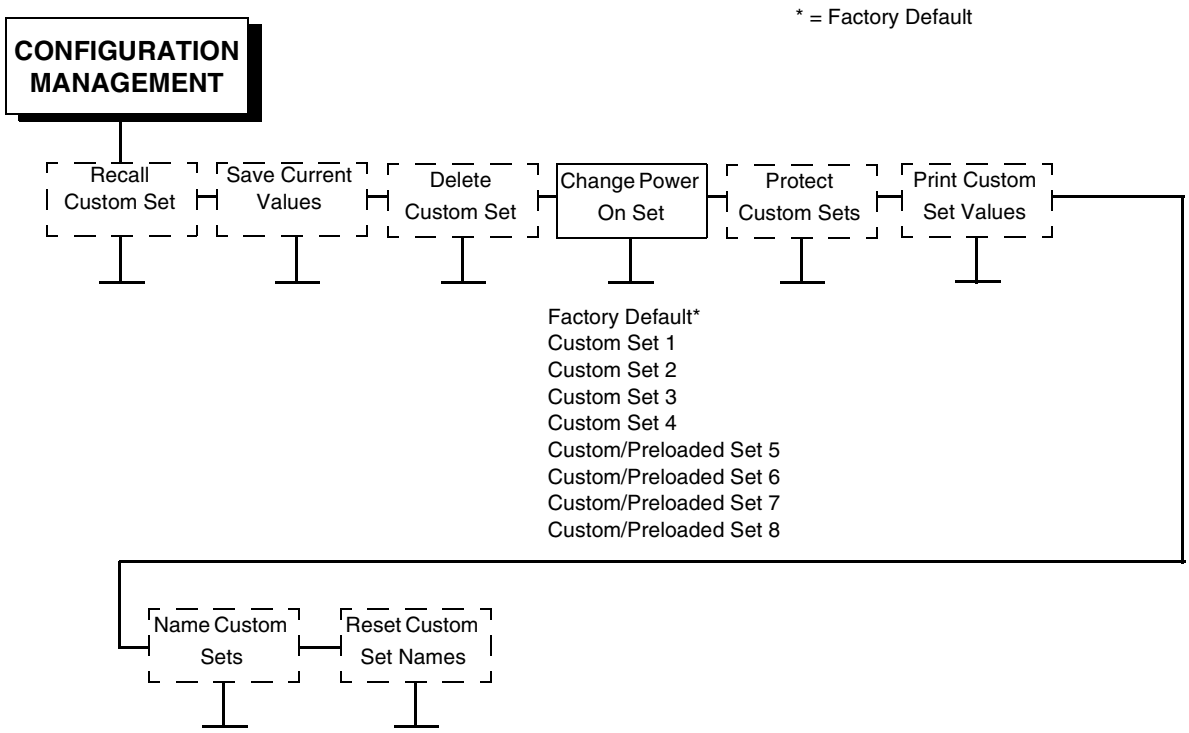


You can load any of the custom set configurations or the factory default configuration. Factory default parameters are shown starting on page 71. The loaded configuration remains active as long as the printer is on. The following procedure shows how to load factory defaults to the printer.

If you power off the printer, the power-on configuration will load the next time the printer is powered on. Selecting the power-on configuration is explained on page 88.

Step	Key	LCD Results	Notes
1. Press	Stop	NOT READY	Places the printer in NOT READY mode.
2.	Scroll↑ + Scroll↓	OPERATOR MENU UNLOCKED	Unlocks the Operator Menu, which allows you to make configuration changes.
3.	Menu	OPERATOR MENU QUICK SETUP	Displays the first Configuration Main Menu option, QUICK SETUP.
4.	Scroll↑ UNTIL	OPERATOR MENU CONFIGURATION MANAGEMENT	Moves to the Configuration Management menu option.
5.	Enter	CONFIGURATION MANAGEMENT RECALL CUSTOM SET	Selects the CONFIGURATION MANAGEMENT menu. The RECALL CUSTOM SET option appears.
6.	Enter	RECALL CUSTOM SET FACTORY DEFAULT	Moves forward to the FACTORY DEFAULT parameter for the RECALL CUSTOM SET option.
7.	Enter	LOADING SAVED CONFIGURATION	Loads the set of Factory Default values. The message “LOADING SAVED CONFIGURATION” appears briefly.
8.	Stop	NOT READY	Returns the printer to the NOT READY mode.
9.	Scroll↑ + Scroll↓	OPERATOR MENU LOCKED	Locks Program mode and the Operator Menu.
10.	Stop	READY	Places the printer in READY mode, prepared for normal operation.

Changing The Power On Configuration



When you power on the printer for the first time, it loads the factory default configuration. If you power the printer off and then back on, the printer will load the designated power-on configuration (which is set to Factory Default by default). It will not load the last saved configuration.

The Change Power On Set option allows you to select a custom set of configuration values as the power-on configuration. The example on the following page shows how to select Custom Set 1 as the power-on configuration.

NOTE: Be sure you define and save a custom set before attempting to use it as the Power On Custom Set. Otherwise, the current Power On Custom Set remains selected and the following operator panel message is displayed:

042 CUSTOM SET DOES NOT EXIST

SAVE FIRST

For example, if you attempt to change the Power On Custom Set from Custom Set 1 to Custom Set 4, and if Custom Set 4 does not exist, Custom Set 1 remains the Power On Custom Set.

Step	Key	LCD Results	Notes
1. Press	Stop	NOT READY	Places the printer in NOT READY mode.
2.	Scroll↑ + Scroll↓	OPERATOR MENU UNLOCKED	Unlocks the Operator Menu, which allows you to make configuration changes.
3.	Menu	OPERATOR MENU QUICK SETUP	Displays the first Configuration Main Menu option, QUICK SETUP.
4.	Scroll↑ UNTIL	OPERATOR MENU CONFIGURATION MANAGEMENT	Moves to the Configuration Management menu option.
5.	Enter	CONFIGURATION MANAGEMENT RECALL CUSTOM SET	Selects the CONFIGURATION MANAGEMENT menu. The RECALL CUSTOM SET option appears.
6.	Scroll↑ OR Scroll↓	CONFIGURATION MANAGEMENT CHANGE POWER ON SET	Moves to the CHANGE POWER SET ON parameter.
7.	Enter	CHANGE POWER ON SET FACTORY DEFAULT	Displays the first POWER ON SET option, FACTORY DEFAULT.
8.	Scroll↑	CHANGE POWER ON SET CUSTOM SET 1	Displays CUSTOM SET 1 as the POWER ON SET option value.
9.	Enter	CHANGE POWER ON SET CUSTOM SET 1*	An asterisk (*) appears after the change is complete.
10.	Stop	NOT READY	Returns the printer to the NOT READY mode.

Step	Key	LCD Results	Notes
11.	Scroll↑ + Scroll↓	OPERATOR MENU LOCKED	Locks Program mode and the Operator Menu.
12.	Stop	READY	Places the printer in READY mode, prepared for normal operation.

4 *Configuration Menus*

Overview

This chapter describes the configuration menus. The Configuration Main Menu options and all of the submenu options are illustrated in menu diagrams and described in detail. For procedures showing how to enter Program mode, save, recall, and print configurations, refer to Chapter 3, “Configuring the Printer.”

Figure 56 shows an overview of the configuration menus.

The configuration menu diagrams on the following pages show the structure of the configuration menus and the parameter options available in each menu. The diagrams list the menus and options in the order they appear when you use the operator panel to configure the printer. Factory default configuration values are indicated by an asterisk (*).

Pressing the operator panel keys (**Enter**, **Return**, **Scroll**↑, and **Scroll**↓) allows you to move through the menus and select various choices for the options, as follows:

- The **Enter** key allows you to move down to a lower level in the menu structure, and to select an option value as the active value.
- The **Return** key moves you back up the menu structure.
- The **Scroll**↑ key moves forward through the options at a particular menu level.
- The **Scroll**↓ key moves backward through the options at a particular menu level.

The Configuration Main Menu

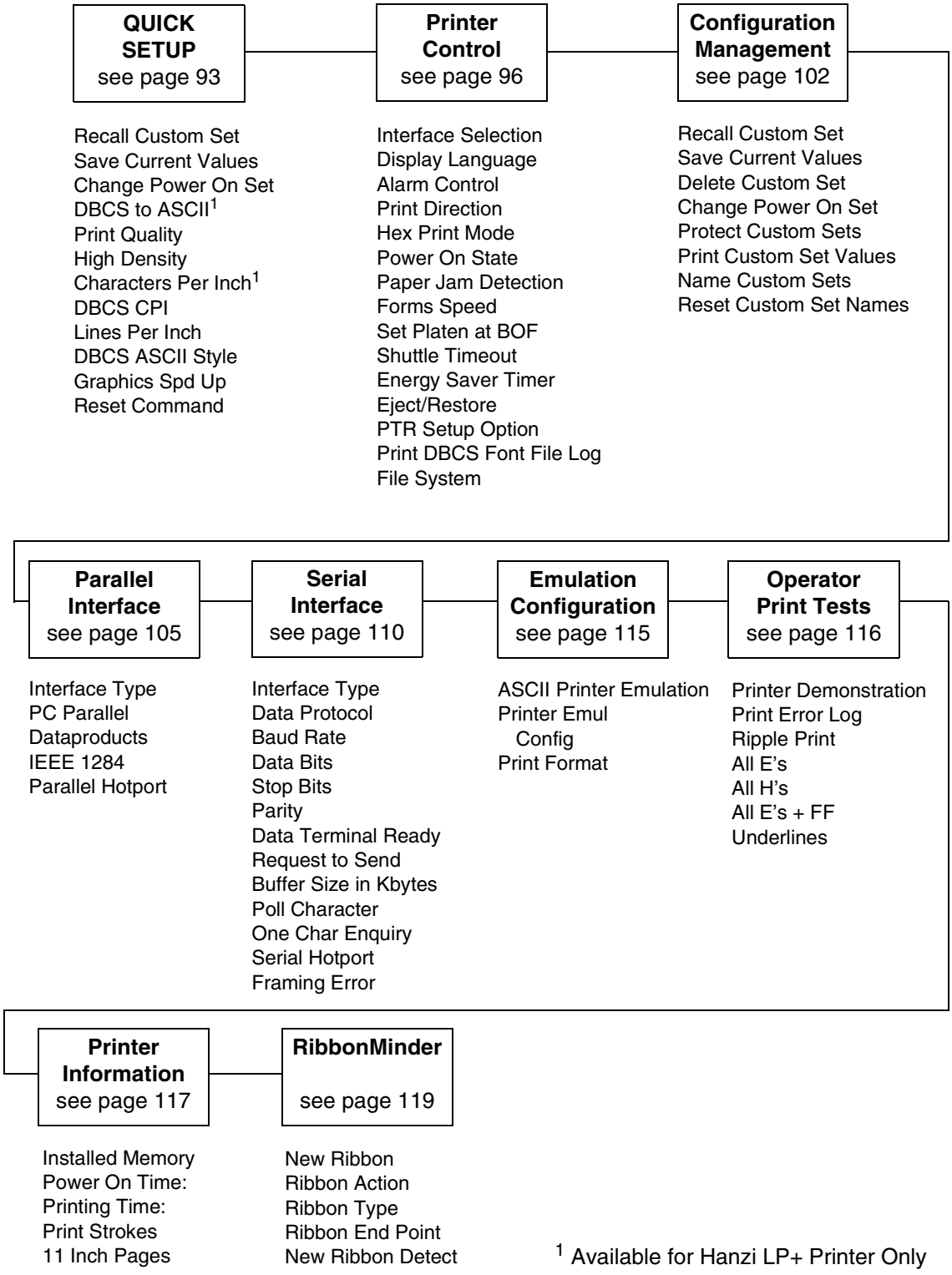
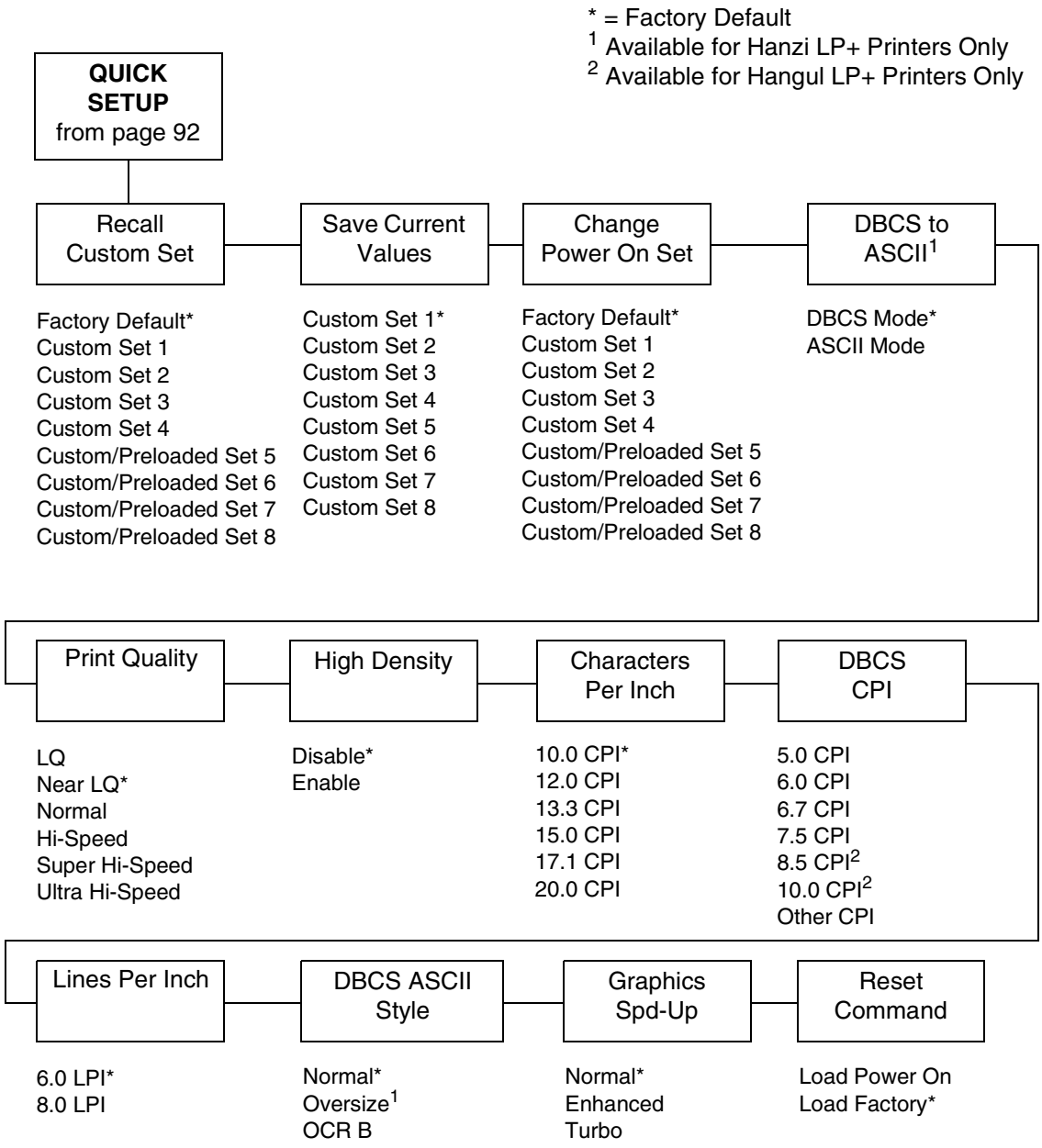


Figure 56. The Configuration Main Menu

Quick Setup Menu



Recall Custom Set

The printer can store numerous configurations in memory. This parameter allows you to select and load a specific configuration.

Save Current Values

This option allows you to save up to eight configurations to meet different print job requirements. This eliminates the need to change the parameter settings for each new job. The configurations are stored in memory and will not be lost if you turn off the printer. If the Protect Configs. parameter is enabled, the new configuration will not be saved unless the existing configuration has been deleted first. The factory default configuration cannot be changed. See “Saving Your Configuration In A Custom Set” on page 84 for details.

Change Power On Set

You can specify which of the nine configurations (Factory or 1-8) will be the power-up configuration.

DBCS to ASCII

This option specifies the operating mode of the Hanzi printer. Refer to “Print Attributes” in the *LQ1600K Programmer’s Reference Manual* for more information.

NOTE: Available for the Hanzi LP+ printers only.

Print Quality

Sets the print quality of the printer. This key requires confirmation with the ENTER key.

NOTE: The factory default for the Hanzi LP+ is Near LQ. The factory default for the Hangul LP+ is LQ.

High Density

High Density enabled will allow the LQ typeface to print in higher print density. It will not take effect when other typefaces are selected.

Characters Per Inch

Defines the default values for horizontal character spacing. The number of characters per inch can be selected from 10.0, 12.0, 13.3, 15.0, 17.1, or 20.0.

NOTE: The option is available for the Hanzi LP+ printer only.

DBCS CPI

Defines the default values for horizontal character spacing in DBCS mode. For the Hanzi LP+ printer, select 5.0, 6.0, 6.7, 7.5, and Other CPI. For the Hangul LP+ printer, selected from 5.0, 6.0, 6.7, 7.5, 8.5, 10, and other CPI.

NOTE: The factory default for the Hanzi LP+ printer is 6.7 cpi. The factory default for the Hangul LP+ printer is 6.0 cpi.

Lines Per Inch

Defines the default values for vertical character spacing. The number of lines per inch can be 6.0, 8.0, 10.3, 3.0, or 4.0.

DBCS ASCII Style

This option specifies the appearance of single-byte numeric characters. For the Hanzi LP+ printer, select from Normal, Oversize and OCRB. For the Hangul LP+ printer, select from Normal, and OCRB.

Graphics Spd-Up

This menu is used to increase (speed up) graphic printing speed by turning on Enhanced/Turbo mode. See “Graphics Spd Up” in the Programmer’s Reference Manual.

Reset Command

When the printer receives a host data stream reset command (ESC @) in addition to resetting printer variables the selected configuration will be loaded.

- **Load Power On**. The power-up configuration is loaded when the reset command is executed.
- **Load Factory** (default). The factory installed configuration is loaded when the reset command is executed.

Printer Control Menu

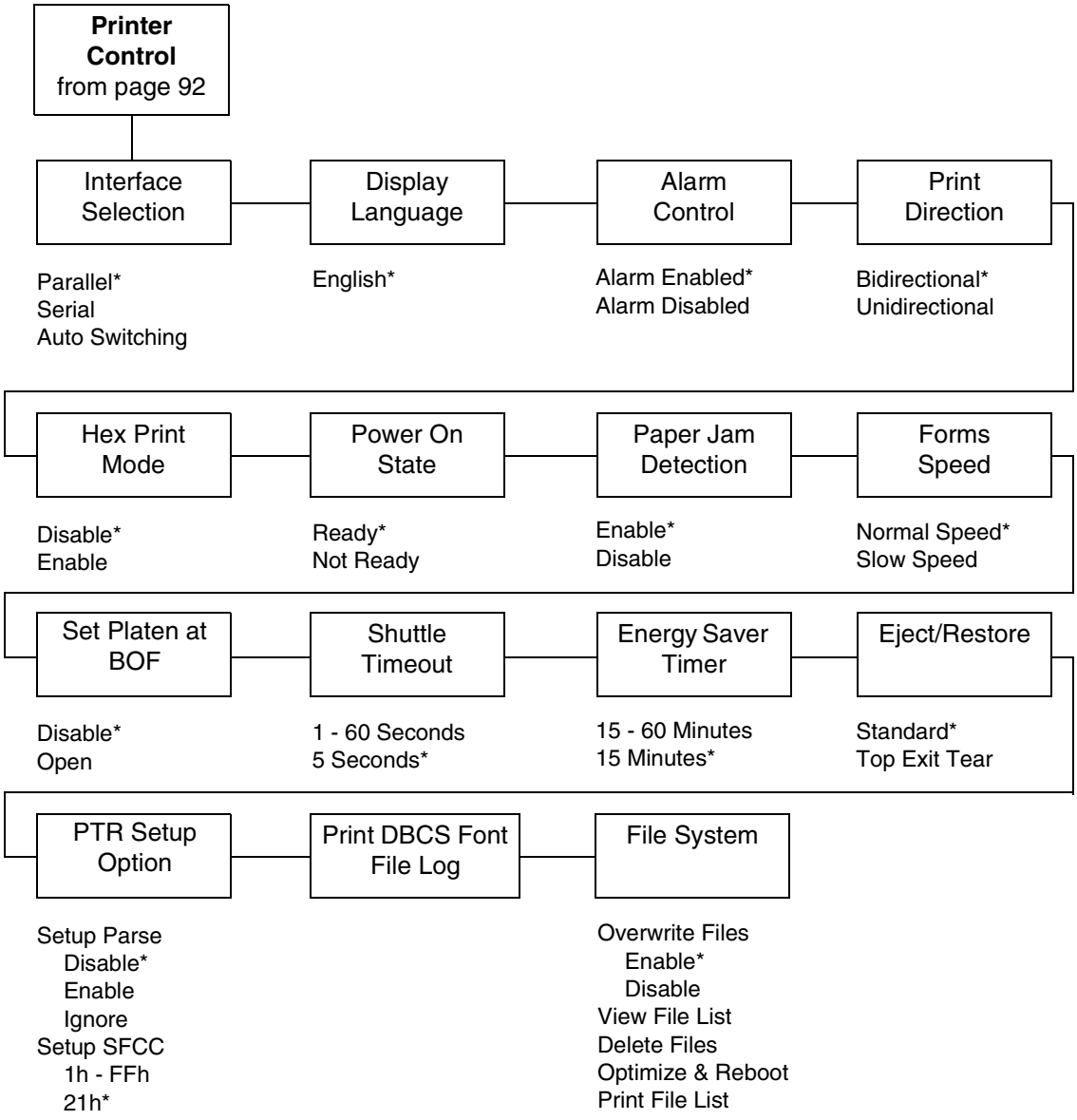


Figure 57. Printer Control Menu

Interface Selection

INTERFACE SELECTION enables or disables physical interfaces for attachment switching. If an interface is disabled, it is set offline and any data received will be ignored.

Selecting Autoswitching provides automatic interface switching among parallel and serial communication. Only one interface can be enabled at a time. Configuration of the Auto Switching Hotport is done from the corresponding interface menu, as shown in the following sections.

When used with serial or parallel, Autoswitching does NOT save the state of each emulation during interface switching. In this case, it is the responsibility of the host application program to initialize the emulation to the desired state at the beginning of each job. It is also the responsibility of the host application program to correctly position the forms at “top of form” at the end of each job.

Display Language

This parameter selects the language in which the operator panel messages will be displayed. The only selection currently available is English.

Alarm Control

This parameter enables or disables the audible alarm. The audible alarm is used to signal problems such as when an end of forms occurs.

Print Direction

The PRINT DIRECTION feature affects both print quality and printing speed. By setting this feature, you can configure the printer to print in both directions of the shuttle sweep (BIDIRECTIONAL), or to print in only one direction (UNIDIRECTIONAL).

You might want to use UNIDIRECTIONAL when printing bar codes, high quality text and graphics, or other printing that requires precise vertical alignment.

Although enabling this feature reduces print speed, it enhances the vertical alignment of dots and produces cleaner, sharper bar codes and text.

- BIDIRECTIONAL (the default) will print all data in both directions of the shuttle sweep. This choice produces higher printing speed.
- UNIDIRECTIONAL will print all data in only one direction of the shuttle sweep. This choice produces higher print quality.

Hex Print Mode

A hex code printout (or hex dump) translates all incoming data to hexadecimal equivalents. A hex dump lists each ASCII data character received from the host computer, together with its corresponding two–digit hexadecimal code. Hex dumps can be used to troubleshoot some types of printer data reception problems.

Refer to page 135 to obtain a hex code printout.

NOTE: Printing in Hex Mode may alter print attributes set at the operator panel or by the host computer. These attributes may need to be reset after exiting Hex Print Mode.

Power On State

This parameter allows you to configure the printer to power on in the READY or NOT READY mode.

Paper Jam Detection

This parameter determines whether or not paper jam detection is active. When set to ENABLE (the default), paper jams are detected and when set to DISABLE, paper jam checking is disabled to prevent false errors.

ATTENTION

When paper jam detection is disabled, the printer does not monitor paper motion. If a paper jam occurs, the printer ignores the condition and continues to print, possibly causing severe damage to the printer.

Forms Speed

FORMS SPEED affects the speed at which paper moves into the stacking area of the printer.

- NORMAL SPEED (the default) will slew and stack paper, such as single-sheet data processing paper, at maximum speed.
- SLOW SPEED will slew and stack at a slower pace. This ensures that forms, such as multiple-sheet, will stack more neatly.

Set Platen at BOF

Some special forms have perforation areas that are thicker than the rest of the form. Enable this parameter when you are using this type of form. This parameter, when Open is selected, allows the platen to open and close when perforations thicker than the rest of a form move across the platen.

In order to retain print quality with this type of form, set the position of the first and last print lines to avoid printing where paper thickness occurs (before and after the perforation). See Forms Length and Perforation Skip for more information.

NOTE: When enabling this parameter, you must set the forms length to match the physical distance between perforations.

Shuttle Timeout

The SHUTTLE TIMEOUT parameter determines the amount of time the shuttle will continue running after printing stops. This allows the shuttle to continue moving during the time between print jobs when the print jobs arrive at frequent intervals. Time is saved if the shuttle is still moving when a print job arrives at the printer, since the printer does not have to wait for the shuttle to reach its operating speed.

Energy Saver Timer

This parameter helps to reduce power consumption when the printer is not in use in order to reduce air pollution caused by power generation. Use of this feature can cut energy use by more than 50 percent.

ENERGY SAVER TIMER determines the amount of time that expires before the printer reduces power after printing stops. The energy saver mode can select an energy saver activation time. The selections are 15 through 60 Minutes. The default time is 15 minutes.

NOTE: If the printer enters energy saver mode while NOT READY, the printer will not print any jobs until made READY by pressing the **Start** key.

Eject/Restore

The EJECT/RESTORE parameter controls how the printer behaves when you press the **Eject/Restore** key. The following options are available:

- STANDARD (the default)
- TOP EXIT TEAR (pedestal models only)

When STANDARD mode is selected, the **Eject/Restore** key operates as follows:

- Pressing **Eject/Restore** causes the paper to advance a preset distance of 22 inches.
- Pressing **Ready** or pressing **Eject/Restore** a second time causes the paper to return to its original position.

NOTE: If you are using this function to tear off forms, you might want to press **Form Feed** before using the **Eject/Restore** function. This will avoid unloading the paper as it is restored to its original position.

When TOP EXIT TEAR mode is selected, the **Eject/Restore** key operates as follows:

- Pressing **Eject/Restore** causes the paper to advance the bottom of the last printed form to the tear position, ready for the operator to tear off the printed forms.
- Pressing **Eject/Restore** a second time causes the paper to move into position such that the top of the first possible form available for printing is positioned ready for printing. (The direction and amount of paper movement will depend on the length of the forms; one or more blank forms will be skipped.)

NOTE: The TOP EXIT TEAR setting is meaningful only on pedestal model printers. TOP EXIT TEAR cannot be selected on cabinet model printers.

Forms length must be set correctly for the TOP EXIT TEAR mode to function properly.

PTR Setup Option

This option selects the Special Function Control Code (SFCC) for the PTR_SETUP command and functions. The selections for this process are given below.

Setup Parse

This selection is used to enable or disable the PTR Setup Option. The default is disable.

Setup SFCC

Sets the legal hex values from 01 through FF. These represent the ASCII code (in hexadecimal) of the character used as the SFCC. The default hex value is 21, which corresponds to the “!” character.

Print DBCS Font File History Log

Currently, this option should not print any History Log of the font file.

File System

Provides the means for listing, viewing, and manipulating files in flash memory. The following selections are available.

Overwrite Files

This selection controls whether the files in flash memory can be overwritten. With the default selection of Enable, files are overwritten. If the selection is disabled, the files can not be overwritten.

View Files

This selection provides a list of files in flash memory. Pressing the **Scroll↓** key allows you to view the file size.

Delete Files

This selection provides a list of files in flash memory. Pressing the **Enter** key will delete the displayed file from flash memory.

Optimize & Reboot

Pressing the **Enter** key with this selection displayed will reclaim flash memory space and reboot the printer.

IMPORTANT

Do not power off the printer until it has completed the reboot and is either Ready or Not Ready.

Print File List

Pressing the **Enter** key with this selection displayed will cause the printer to print a summary of files stored in flash memory. Statistics on file system usage are also printed.

Configuration Management Menu

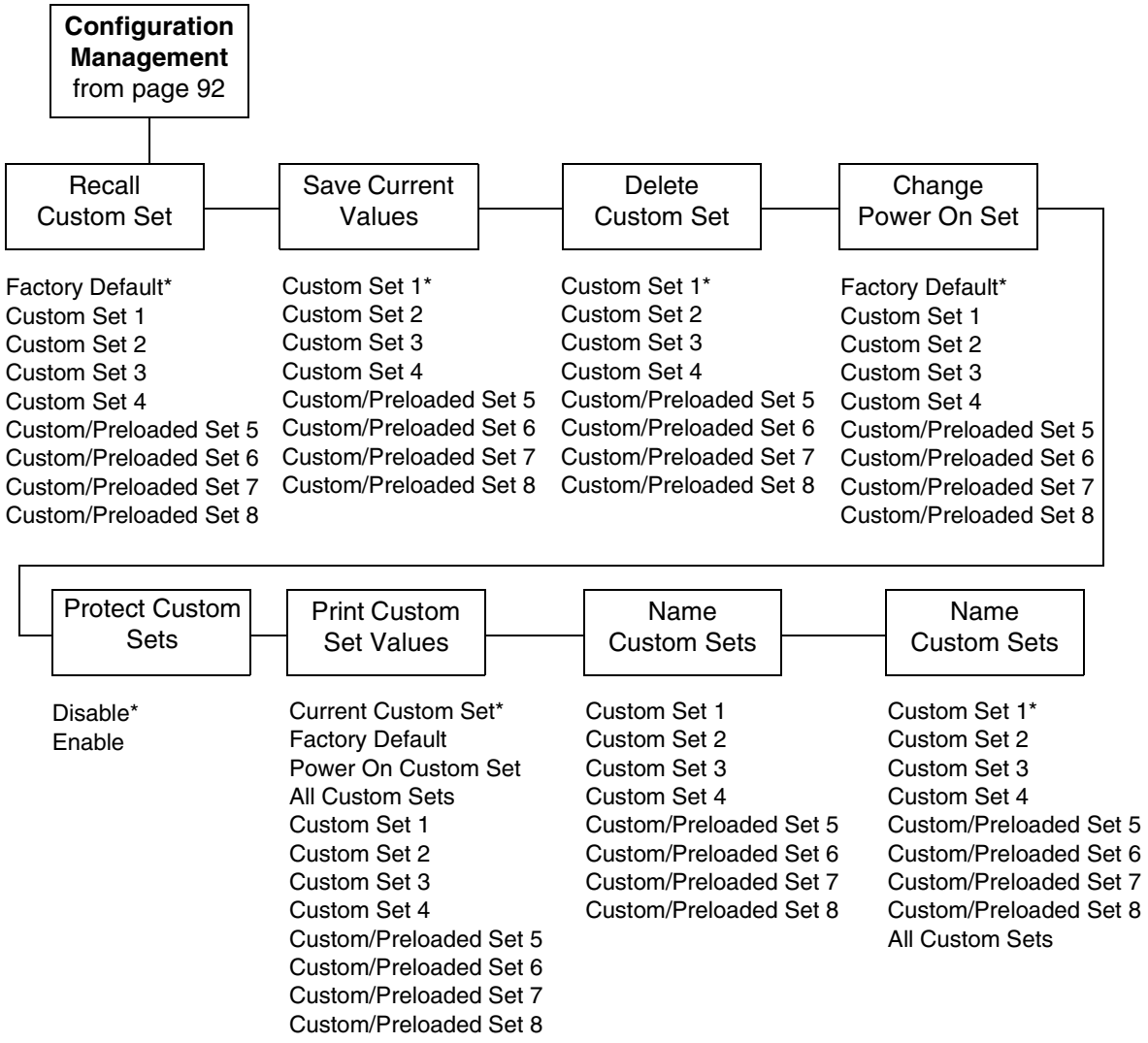


Figure 58. Configuration Management Menu

Recall Custom Set

The printer can store 8 custom sets in NVRAM. This parameter allows you to select and load a specific custom set.

Factory Default is the factory–preset custom set; its parameters cannot be changed. It is always available for loading.

Custom/Preloaded Sets 5-8 contain configuration sets that assist with the installation and configuration of this printer. These sets are preloaded at the factory. If these sets are not used, you can delete them and create new custom sets.

Save Current Values

This option allows you to save your custom sets to meet different print job requirements. This eliminates the need to change the parameter settings for each new job.

The custom sets are stored in NVRAM—they will not be lost if you power off the printer.

Factory default is a factory–preset custom set; it cannot be changed or saved.

IMPORTANT

A new custom set will overwrite an existing custom set if the PROTECT CUSTOM SETS parameter is disabled (e.g., a new Custom Set 4 will overwrite an existing Custom Set 4). See the "Protect Custom Sets" in this section.

Delete Custom Set

You can delete one or all of your customized or preloaded custom sets. Factory default is a factory–preset custom set and cannot be changed or deleted.

Change Power On Set

You can specify which of the custom sets will be the power-on set. The printer will power on with the factory set values or with one of the customized configurations.

Protect Custom Sets

The PROTECT CUSTOM SETS option specifies whether or not a new custom set can overwrite an existing custom set when you activate the SAVE CURRENT VALUES parameter.

- DISABLE (the default) turns protection off, allowing you to overwrite existing custom sets.
- ENABLE turns protection on, preventing you from overwriting existing custom sets. If you attempt to save to an existing set, the following operator panel message appears:

  043 CUSTOM SET EXISTS

You must delete the existing set before trying to save the new custom set.

Print Custom Set Values

This option is used to print a listing of various stored printer custom sets. It is recommended that you store the printout of the custom sets in a safe place for quick referral.

Name Custom Sets

You may specify a 30-character name which can be used to refer to a custom set. The name you enter for a custom set will be used in the Recall Custom Set, Save Current Values, Delete Custom Set, Change Power On Set, Protect Custom Sets, Print Custom Set Values, and Name Custom Sets menu. The name can only be cleared by using the Reset Custom Set Names menu.

Press the MICRO UP or MICRO DOWN keys to cycle through the values available for that character at the cursor location. Press the SCROLL UP key to move to the next character to be modified. Press the SCROLL DOWN key to go back to the character to be modified. Continue until you have entered the name you want to give to this custom set, then press ENTER to save. The name you entered will now represent this custom set on the printer's front panel. To exit this menu without saving, press any key other than the ENTER key. The custom set name will revert to the last saved value.

Reset Custom Set Names

You can reset specific custom set names back to the default value of the configuration number.

Parallel Interface Menu

More information about these interfaces is in Chapter 5, “Printer Interfaces.”

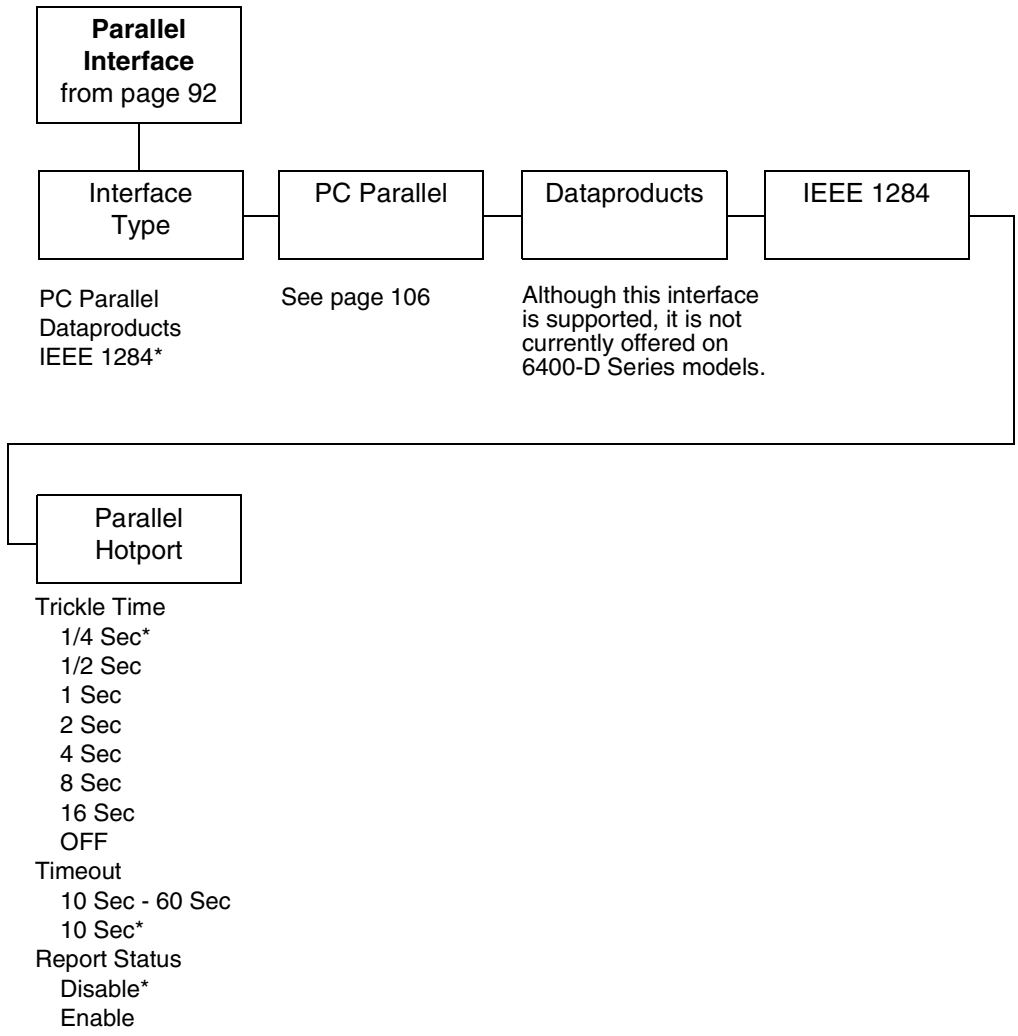


Figure 59. Parallel Interface Menu

Interface Type

The INTERFACE TYPE parameter selects which electrical interface will drive the parallel port interface, as follows:

- PC PARALLEL
- DATAPRODUCTS - Although this interface is supported, it is not currently offered on 6400-D Series models.
- IEEE 1284 (the default)

PC Parallel Menu

The PC PARALLEL menu configures the electrical signals to operate as a PC Parallel printer.

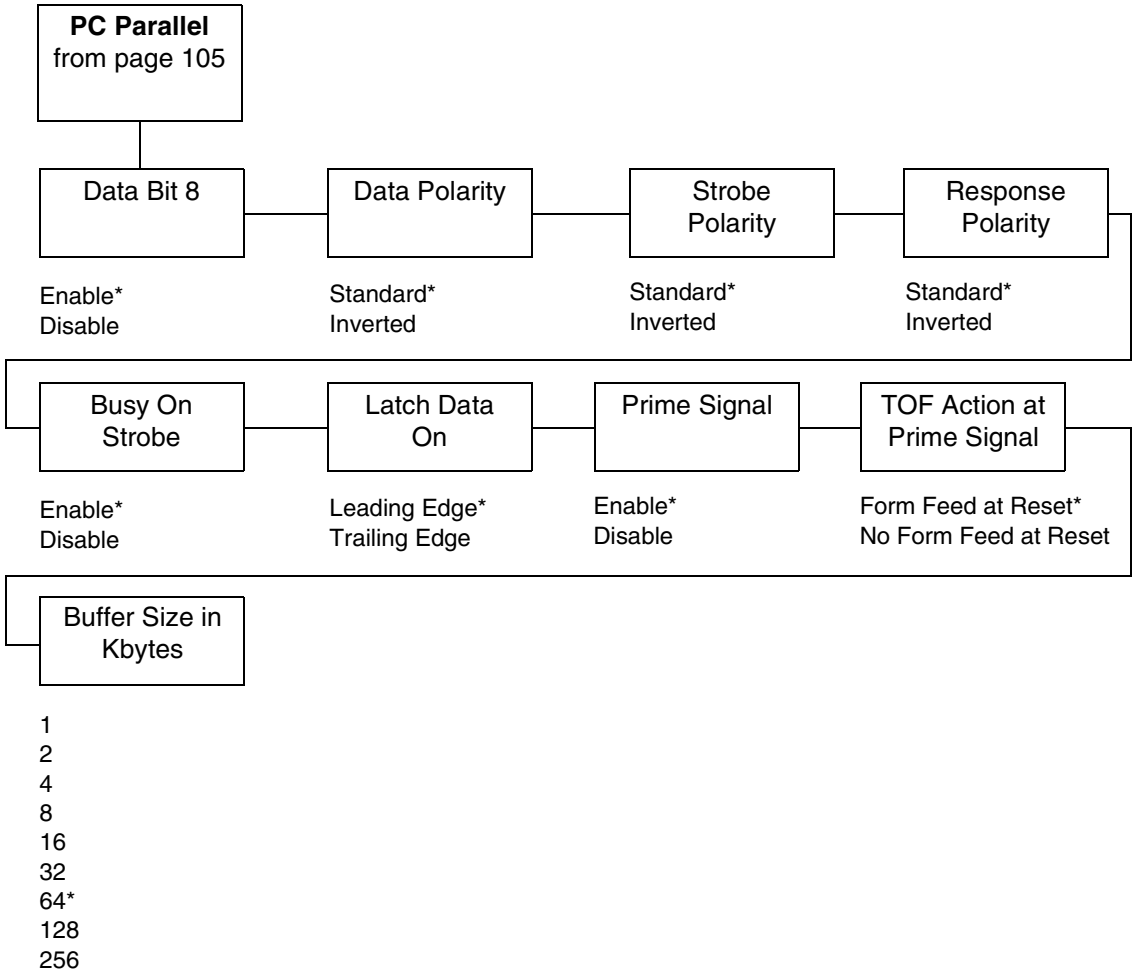


Figure 60. PC Parallel Menu

Data Bit 8

The DATA BIT 8 parameter allows access to the extended ASCII character set. This parameter is Enabled by default. When this parameter is Disabled, the printer interprets bit 8 of each incoming data character as a zero, regardless of its actual setting.

Data Polarity

The DATA POLARITY parameter must be set to match the data polarity of your host computer.

- STANDARD (the default) does not expect the host computer to invert the data.
- INVERTED expects the host computer to invert the data received on the data lines. Ones become zeros, and vice–versa.

Strobe Polarity

The STROBE POLARITY must be set to match the data strobe polarity of your host computer. When the host computer sends a data strobe signal to the printer, this enables the printer to read the data bus.

- STANDARD (the default) does not expect the data strobe signal to be inverted.
- INVERTED expects the host computer to invert the data strobe signal.

Response Polarity

The RESPONSE POLARITY parameter must be set to match the response polarity of your host computer.

- STANDARD (the default) does not invert the response signal.
- INVERTED inverts the response signal sent to the host computer.

Busy on Strobe

BUSY ON STROBE determines when the Busy signal is asserted.

- ENABLE (the default) asserts a busy signal after each character is received.
- DISABLE asserts a busy signal only when the print buffers are full.

Latch Data On

The LATCH DATA ON parameter specifies whether the data is read on the leading or trailing edge of the data strobe signal.

- LEADING EDGE (the default)
- TRAILING EDGE

Prime Signal

ENABLE (the default). When set and the host asserts the PRIME SIGNAL, the parallel port will perform a warm start.

- DISABLE. The parallel port will not perform a warm start when the host asserts the PRIME SIGNAL.

TOF Action at Prime Signal

TOF (Top–of–Form) ACTION AT PRIME SIGNAL determines whether or not a form feed is performed before a warm start when the prime signal is asserted from the host. This setting is only used if PRIME SIGNAL parameter is enabled.

- FORM FEED AT RESET (the default)
- NO FORM FEED AT RESET

Buffer Size in Kbytes

This parameter determines the size of the input buffer. The maximum input buffer is up to 256K. 64K is the default.

Dataproducts Menu

Although this interface is supported, it is not currently offered on 6400-D Series models.

IEEE 1284

The IEEE 1284 interface is faster and more versatile than Centronics and supports bidirectional communication. The IEEE 1284 interface has no parameters that are adjustable via the operator panel. For more information, see Chapter 5, “Printer Interfaces.”

Parallel Hotport

This option gives the printer the ability to handle multiple data streams simultaneously. It allows the printer to service hosts attached to the parallel ports as if they were the only interface connected.

Trickle Time

This functionality prevents an attached host from timing out. In order to support this feature, the port has to be able to accept data from the host and store it for future use. The selected value is the time that the printer waits before getting the next byte of data from the host. Set the value to be less than the host time out value. If the value is too much shorter, the printer fills up its buffer too fast. Values are: 1/4 Sec (the default), 1/2 Sec, 1 Sec, 2 Sec, 4 Sec, 8 Sec, 16 Sec, and Off.

Timeout

This is the value used by the printer to time out from the current port and check the other ports for data to print. When the printer has not received data from the host after a certain period of time, it needs to Timeout in order to service the other ports. Values are from 1 through 60 seconds, with 10 seconds as the default.

Report Status

When this option is enabled, faults are reported even if the fault is not on the current active port. If the option is disabled, the default, a fault on the printer is reported only if it occurs on the active port.

Serial Interface Menu

IMPORTANT

The serial interface parameters in the printer must be set to match the serial interface in the host computer (at the other end of the printer data cable). Otherwise, the printer may not operate correctly, and data characters from the computer may not print or may appear as "garbled" text.

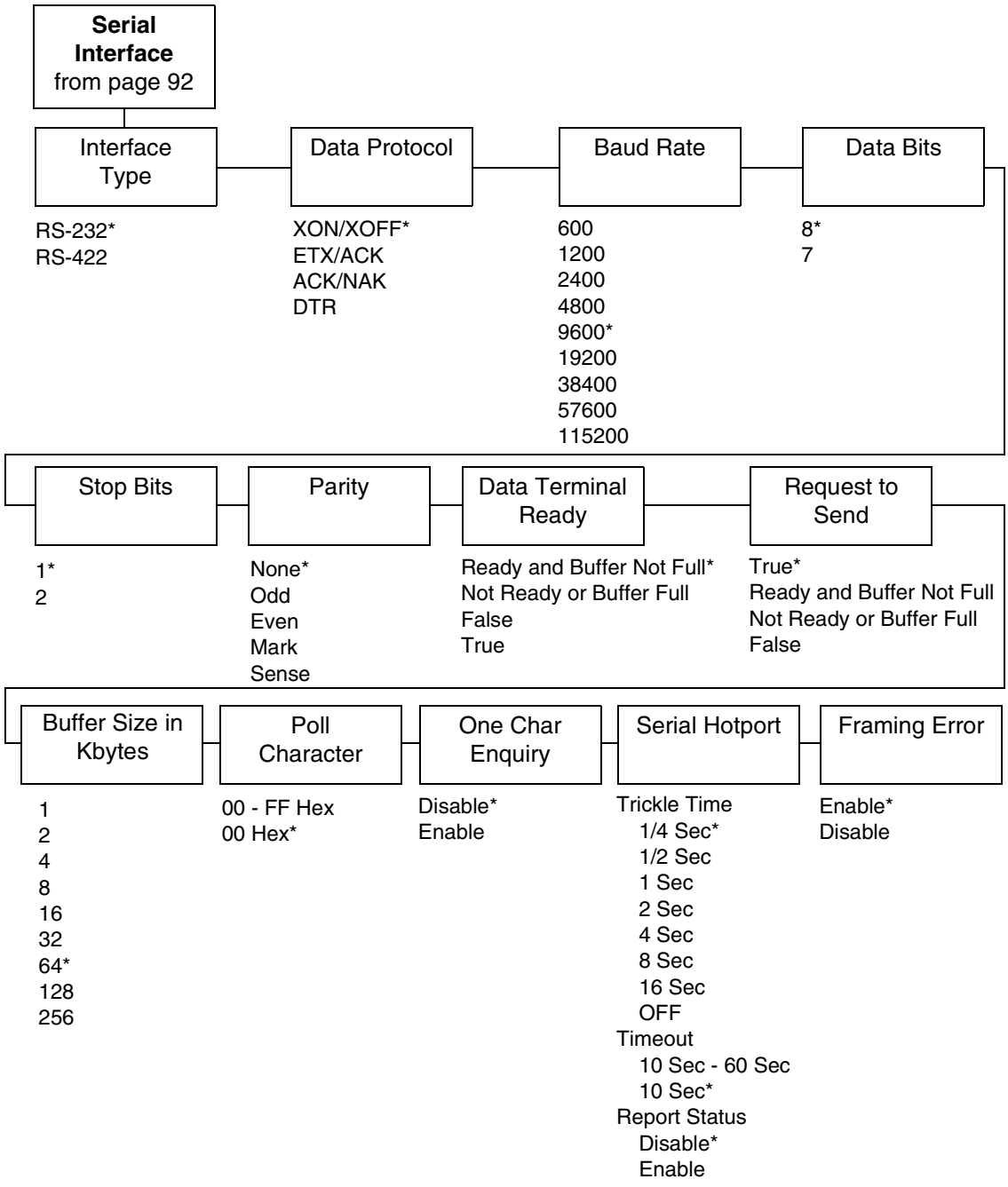


Figure 61. Serial Interface Menu

Interface Type

This parameter configures the electrical interface for the serial port, as follows:

- RS-232 (the default)
- RS-422

Data Protocol

You may select one of the following serial interface protocols to meet the host interface requirements.

- XON / XOFF (the default) — Transmit On / Transmit Off. The printer controls the flow of communication from the host by telling the host to turn the transmission on and off. This is the factory default serial protocol.
- ETX / ACK — End of Text / Acknowledge. The host controls the flow of communication to the printer by sending a block of data and ending the block with an End of Text (ETX) signal. When the printer receives the ETX signal, it will acknowledge it has received the entire block of data.
- ACK / NAK — Acknowledge / Negative Acknowledge. ACK means acknowledge; the device acknowledges it has accepted a transmission. NAK means a negative acknowledge; the device did not receive the transmission.
- DTR — (DTE Ready). The printer controls the data flow by asserting or de-asserting this hardware signal to the host. If there is enough room in the printer buffer, the printer will send a high signal; if the buffer is full the printer will send a low signal. DTR tells the host if it is safe to send more data. (If the host sends data during an unsafe condition, data will be lost.)

Baud Rate

This parameter sets the baud rate of the serial interface in the printer. Baud rate is the speed at which serial data is transferred between the host computer and the printer.

- 600 BAUD
- 1200 BAUD
- 2400 BAUD
- 4800 BAUD
- 9600 BAUD (the default)
- 19200 BAUD
- 38400 BAUD
- 57600 BAUD
- 115200 BAUD

Data Bits

The DATA BITS parameter sets the length of the serial data word. The length of the data word must match the corresponding data bits setting in the host computer.

- 8 BITS (the default)
- 7 BITS

Stop Bits

The STOP BITS parameter sets the number of stop bits in the serial data word. The setting must match the corresponding stop bit setting in the host computer. One (1, the default) or two (2) stop bits can be selected.

Parity

The PARITY parameter setting can be set for the following:

- NONE (the default)
- ODD
- EVEN
- MARK
- SENSE

The setting must match the corresponding parity setting in the host computer.

Data Terminal Ready

This configuration is part of hardware flow control and determines when the DATA TERMINAL READY (DTR) signal is generated. This signal indicates whether or not the printer is ready to receive data.

- READY AND BUFFER NOT FULL (the default) asserts the DTR signal when the printer is READY and the internal serial buffer is not full.
- NOT READY OR BUFFER FULL asserts the DTR signal when the printer is NOT READY or the internal serial buffer is full.
- FALSE never asserts the DTR signal.
- TRUE continuously asserts the DTR signal.

NOTE: When the printer is attached to an AS/400 or RISC 6000, the DTR should be set to TRUE.

Request to Send

This configuration is part of hardware flow control and determines when the REQUEST TO SEND (RTS) signal is generated. This signal indicates whether or not the printer is ready to receive data.

- READY AND BUFFER NOT FULL asserts the RTS signal when the printer is READY and the internal serial buffer is not full.
- NOT READY OR BUFFER FULL asserts the RTS signal when the printer is NOT READY or the internal serial buffer is full.
- FALSE never asserts the RTS signal.
- TRUE (the default) continuously asserts the RTS signal.

NOTE: XON/XOFF is always on. See page 123 for more information.

Buffer Size in Kbytes

This parameter determines the size of the input buffer. The maximum input buffer is up to 256K. 64K is the default.

Poll Character

This option is used when One Char Enquiry is enabled. Whenever the printer receives this character, it sends a response to the host indicating the current state of the printer. It may be configured from 00 through FF Hex. The default value is 00.

One Char Enquiry

When enabled a status byte is sent back to the host when the poll character or the command SFCC enquiry is sent to the printer (serial interface only). The poll character is received and the status byte is sent whether the printer is online or offline. The SFCC enquiry will only be processed when the printer is online.

The status byte sent to the host is defined as follows:

BIT	USE
7,6	0
5	1
4	0
3	1 = printer fault
2	1 = IGP busy
1	0 = offline, 1 = online
0	1 = serial input buffer exceeds xoff/on

Serial Hotport

This option gives the printer the ability to handle multiple data streams simultaneously. It allows the printer to service hosts attached to the serial or parallel ports as if they were the only interface connected.

Trickle Time

This functionality prevents an attached host from timing out. In order to support this feature, the port has to be able to accept data from the host and store it for future use. The selected value is the time that the printer waits before getting the next byte of data from the host. Set the value to be less than the host time out value. If the value is too much shorter, the printer fills up its buffer too fast. Values are: 1/4 Sec (the default), 1/2 Sec, 1 Sec, 2 Sec, 4 Sec, 8 Sec, 16 Sec, and Off.

Timeout

This is the value used by the printer to time out from the current port and check the other ports for data to print. When the printer has not received data from the host after a certain period of time, it needs to Timeout in order to service the other ports. Values are from 1 through 60 seconds, with 10 seconds as the default.

Report Status

When this option is enabled, faults are reported even if the fault is not on the current active port. If the option is disabled, the default, a fault on the printer is reported only if it occurs on the active port.

Framing Error

- ENABLE (the default).
- DISABLE allows framing error to be ignored.

Emulation Configuration Menu

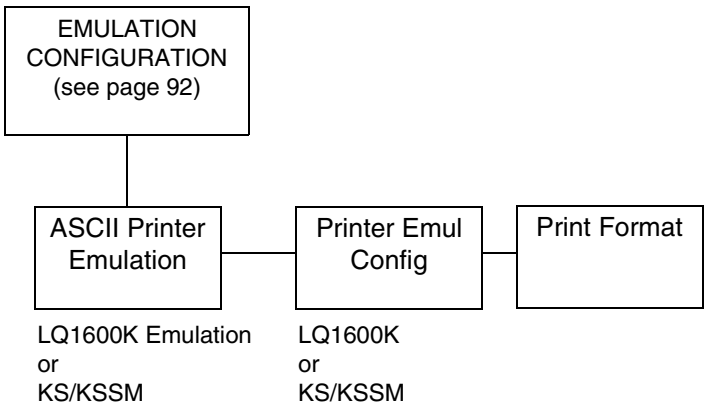


Figure 62. Emulation Configuration Menu

Your printer supports the LQ-1600K or KS/KSSM emulations. These emulations are included with your printer.

These emulations are features that must be ordered separately. These features may have been installed at the factory if the features were ordered with the printer.

All the emulations contain the same configuration submenus shown on page 92. The “EMULATION CONFIGURATION” submenu, however, is unique for each emulation.

For more information on these features, refer to the documentation shipped with the feature or to the “Related Documents” section that begins on page 12.

ASCII Printer Emulation

This parameter allows selection of the printer emulation. The LQ-1600K Emulation is the only available for the Hanzi printer, and KS or KSSM Emulation is available for the Hangul printer.

Printer Emulation Configuration

This parameter configures the printer emulation and page formatting. The submenu contains only LQ-1600K for the Hanzi printer. The LQ-1600K emulation is described in the *IBM 6400-D Generation II Series LQ-1600K Programmer’s Reference Manual.* The submenu contains KS and KSSM for Hangul printer. The emulations description can be found in *IBM 6400-D Generation II Series KS* or *KSSM Programmer’s Reference Manual.*

Print Format

This parameter configures page formatting. The submenus are described in the *IBM 6400-D Generation II Series LQ-1600K Programmer's Reference Manual* or in the *IBM 6400-D Generation II Series KS/KSSM Programmer's Reference Manual*.

Operator Print Tests Menu

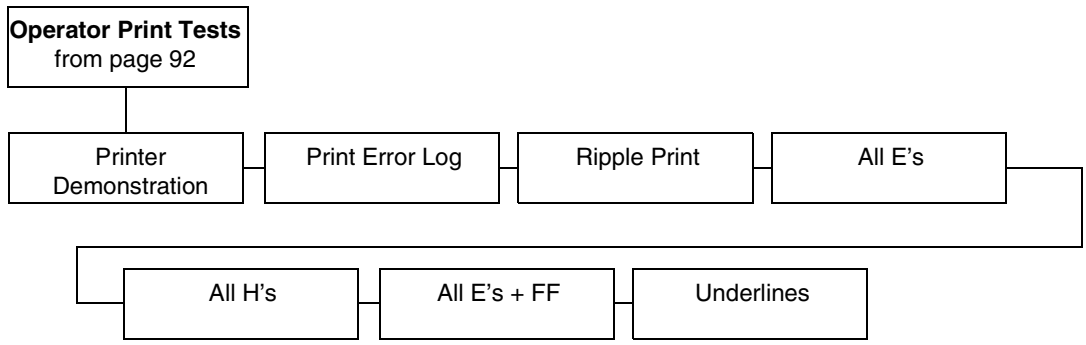


Figure 63. Operator Print Tests Menu

NOTE: This print-test page contains important system information and should be maintained with your system configuration printout.

The print tests are used to check the print quality and operation of your printer.

The self-tests include the following:

Printer Demonstration

Demonstrates some of the functions and features available on the printer.

Print Error Log

Prints a log of errors that have occurred in the printer.

Ripple Print

A "sliding" alphanumeric pattern used to identify missing or malformed characters, improper vertical alignment, or vertical compression.

All E's

A pattern of all uppercase E's that identifies missing characters, misplaced dots, smeared characters, improper phasing problems, or light/dark character variations.

All H's

A pattern of all uppercase H's used to detect missing characters, misplaced dots, smeared characters, or improper phasing.

All E's + FF

A pattern of all E's repeated for ten lines and followed by a form feed to the next page top-of-form, used to identify paper motion or feeding problems, such as paper path obstruction or improper forms.

Underlines

An underline pattern useful for identifying hammer bank misalignment.

Printer Information Menu

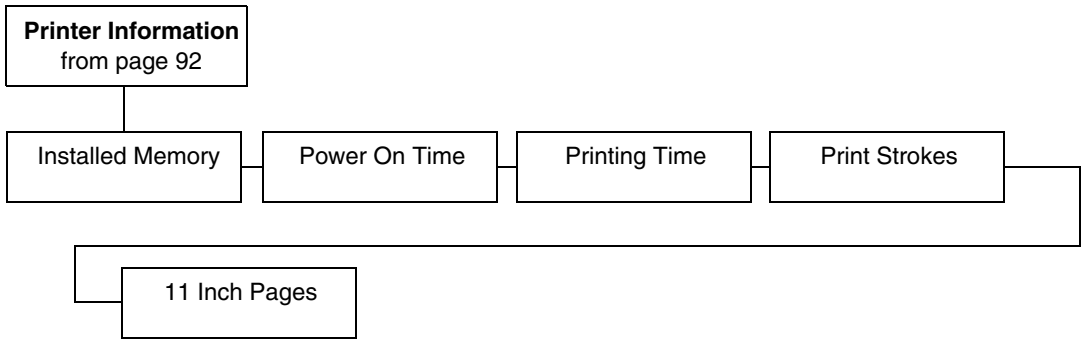


Figure 64. Printer Information Menu

You can view various printer statistics, such as hours of usage, and refer to these figures for preventive maintenance purposes. Printer statistics accumulate continuously; they do not reset when you power off the printer.

All of the printer statistics are set to zero at the factory after burn–in testing.

Installed Memory

Displays the amount of RAM installed in the printer in megabytes.

Power-on Time:

The cumulative time in hours the printer has been powered on. The range is 0 through 30,000 hours.

Printing Time:

The cumulative time in hours the printer has actually been printing. The range is 0 through 30,000 hours.

Print Strokes:

The cumulative number of back–and–forth shuttle strokes the printer has printed during normal operation. The range is 0 through 4,000,000,000 shuttle strokes.

11 Inch Pages:

The cumulative number of pages the printer has printed. The range is 0 through 363,000,000 pages.

Ribbonminder Menu

RibbonMinder** monitors ribbon usage to ensure quality printing. The “RibbonMinder” chapter explains how to use this feature and its options in more detail.

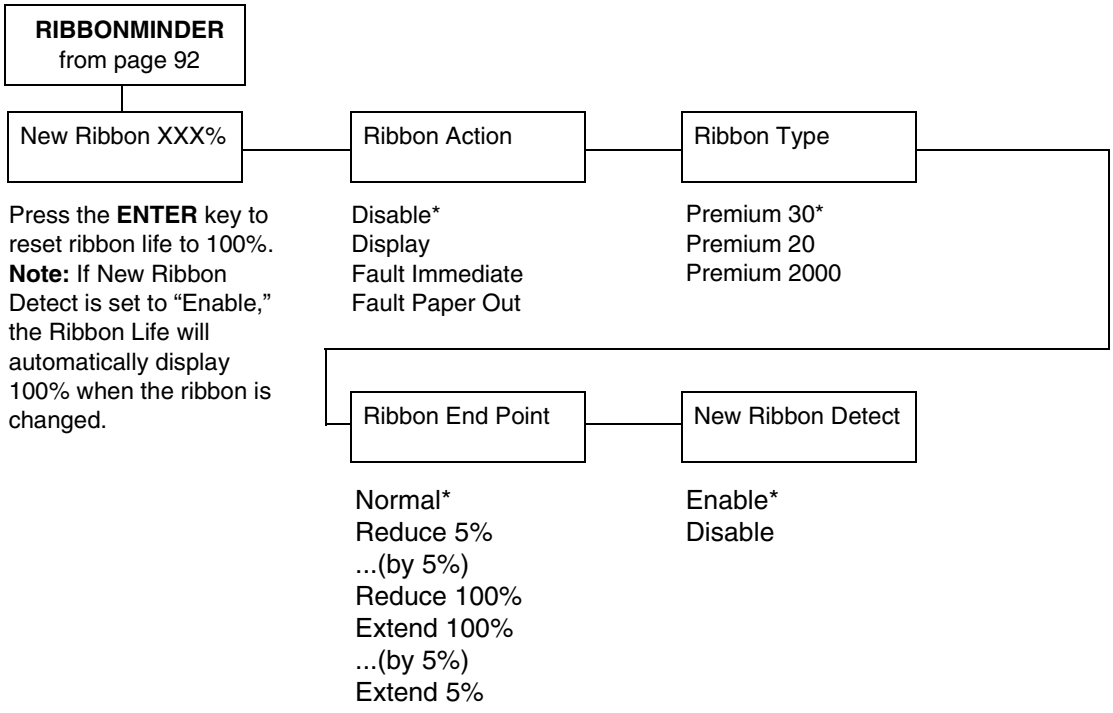


Figure 65. Ribbon Life Menu

New Ribbon

Whenever you install a new ribbon, and are using the RibbonMinder feature, the ribbon life must be reset to 100%. You can reset the ribbon life to 100% from the operator panel using the New Ribbon option by pressing the **Enter** key.

Ribbon Action

This option allows you to select the following three functions:

- DISABLE does not display the RibbonMinder ink consumption percentage. The percentage is calculated but not displayed.
- DISPLAY allows you to view the RibbonMinder ink consumption display.
- FAULT IMMEDIATE displays an error message, which is Ribbon Ink Out, Change Ribbon, when the RibbonMinder consumption percentage falls to zero. The error message can be cleared and printing can continue for approximately another two minutes. If either the RibbonMinder is not reset or a new ribbon is not installed, an error message will be displayed again.
- FAULT PAPER OUT allows you to continue printing despite ribbon life reaching 5% until the printer runs out of paper. When the End Of Forms/ Load Forms condition is cleared (paper is loaded), then the Ribbon Ink Low/Change Ribbon message appears.

Ribbon Type

You can use the Ribbon Type option to specify the type of ribbon to be used.

- Premium 30
- Premium 20
- Premium 2000

Ribbon End Point

Enables you to print more or less pages before the display reaches 0%. Refer to Chapter 7, “RibbonMinder” for more information.

- Normal (default)
- Reduction from 5% through 100%
- Extension from 100% through 5%

New Ribbon Detect

Allows you to select the way the fault message will be reset.

- ENABLE automatically resets the RibbonMinder when a new ribbon is installed by opening the platen.
- DISABLE

5 Printer Interfaces

Overview

The printer interface is the point where the data line from the host computer plugs into the printer. The interface processes all communications signals and data to and from the host computer. The printer interface consists of a printed circuit board assembly (PCBA) and a cable connector for the data line. Communication signals and data may be sent over parallel or serial lines.

Each IBM 6400-D Series printer is equipped with three parallel interface protocols and two serial interface protocols. Each interface is selected via the operator panel configuration menu. Refer to Chapter 3, “Configuring the Printer.”

This chapter describes the interfaces provided with the printer. In addition, instructions are provided for configuration of terminating resistors.

- RS-232 serial
- RS-422 serial
- PC Parallel
- IEEE 1284

RS-232 And RS-422 Serial Interfaces

NOTE: The RS-232 and RS-422 serial interface circuit characteristics are compatible with the Electronic Industry Association Specifications EIA**-232-E and EIA-422-B.

The RS-232 and RS-422 serial interfaces enable the printer to operate with bit serial devices that are compatible with an RS-232 controller. The input serial data transfer rate (in baud) is selectable from the printer operator panel. Baud rates of 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, and 115,200 are available.

The input format consists of a single start bit, 7 or 8 data bits, and one or two stop bits. The number of data bits is determined by printer configuration. The data bits are interpreted with the least significant bit first. Parity checking is determined by printer configuration options selected from the operator panel.

The printer interface uses a first–in/first–out buffer. The asynchronous interface accepts data as it is provided by the host. The length of the data cable from the host computer to the printer must not exceed 50 feet (15 meters) for RS-232 interfaces and 4000 feet (1220 meters) for RS-422 interfaces.

Table 1. RS-232 Serial Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
Received Data (RD)	3	Transmit Data (TD)	2	Chassis Ground	1
Clear To Send (CTS)	5	Request To Send (RTS)	4	Signal Ground	7
Data Set Ready (DSR)	6	Data Terminal Ready (DTR)	20		
Data Carrier Detect (DCD)	8				

Table 2. RS-422 Serial Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
- Receive Data (-RD)	15	- Transmit Data (-TD)	19	Chassis Ground	1
+ Receive Data (+RD)	17	+ Transmit Data (+TD)	25	Signal Ground	7

RS-232 And RS-422 Serial Interface Signals

The RS-232 connector mounted on the printer is a 25-pin DB-25S type. The mating connector is a DB-25P. RS-232 and RS-422 compatible serial interface signals are defined as follows:

RS-232:

Received Data (RD) — Serial data stream to the printer.

Transmitted Data (TD) — Serial data stream from the printer for transmitting status and control information to the host. Subject to protocol selection.

Request To Send (RTS) — Control signal from the printer. Subject to configuration.

Clear To Send (CTS) — Status signal to the printer indicating the host is ready to receive data/status signals from the printer.

Data Set Ready (DSR) — Status signal to the printer indicating the host is in a ready condition.

Data Carrier Detect (DCD) — Status signal to the printer. The ON condition is required for the printer to receive data.

Data Terminal Ready (DTR) — Control signal from the printer. Subject to configuration.

RS-422:

+RD, -RD — Serial data stream deferentially received by printer.

+TD, -TD — Deferentially driven serial data stream for transmitting status and control information.

NOTE: ±RD and ±TD form signal and return paths of a differential line signal.

RS-232 Serial Interface Protocols

DTR — (DTE Ready). The printer controls the data flow by asserting or de-asserting this hardware signal to the host. If there is enough room in the printer buffer, the printer will send a high signal; if the buffer is full the printer will send a low signal. DTR tells the host if it is safe to send more data. (If the host sends data during an unsafe condition, data will be lost.)

RS-232 And RS-422 Serial Interface Protocols

X-ON / X-OFF — Transmit On / Transmit Off. The printer transmits an X-ON character (hex 11) when entering the Ready mode or when the buffer is almost empty. The printer transmits an X-OFF character (hex 13) when entering the Not Ready mode or when the buffer is almost full.

ETX / ACK — End of Text / Acknowledge. The host controls the flow of communication to the printer by sending a block of data and ending the block with an End of Text (ETX) signal. When the printer receives the ETX signal, it will acknowledge it has received the entire block of data.

ACK / NAK — Acknowledge / Negative Acknowledge. ACK means acknowledge; the device acknowledges it has accepted a transmission. NAK means a negative acknowledge; the device did not receive the transmission.

RS-232 And RS-422 Serial Interface Error Handling

NOTE: All serial errors are treated as faults that require operator intervention.

Parity Error Handling — Parity error checking is a configuration option selected from the operator panel.

With odd or even parity checking selected, a character with a parity error is replaced with a question mark (?) character.

When parity checking is not selected (“NONE” on the operator panel), parity errors are ignored and the characters are printed as received.

Framing Error Handling — Framing error checking is always in effect for the serial interface.

When a framing error occurs, an exclamation point (!) is printed. If 20 successive errors are received, a line feed is added to force printing to occur.

Overrun Error Handling — Overrun error checking is always in effect for the serial interface.

When a data overrun error occurs, an asterisk (*) is printed. If 20 successive errors are received, a line feed is added to force printing to occur.

RS-232 And RS-422 Serial Interface Configuration

Your printer is configured at the factory to match the interface you specified. By using the operator panel, you may verify and change several interface parameters in order to meet specific application requirements.

Refer to Chapter 4, “Configuration Menus,” for RS-232 and RS-422 parameter descriptions and information on selecting values for the following parameters:

RS-232 and RS-422:

- Baud Rate (data rate selected from the operator panel)
- Data Bits (7 or 8 Bits)
- Stop Bits (1 or 2 Bits)
- Parity (None, Odd, Even, Mark or Sense)

RS-232 only:

- Data Terminal Ready logic
- Request to Send logic

Some application programs require a unique configuration. If the printer is not working properly in the configuration you selected, contact an IBM service representative.

One Char Enquiry

When enabled a status byte is sent back to the host when the poll character or the command SFCC enquiry is sent to the printer (serial interface only). The poll character is received and the status byte is sent whether the printer is online or offline. The SFCC enquiry will only be processed when the printer is online.

Poll Character

This option is used when One Char Enquiry is enabled. Whenever the printer receives this character, it sends a response to the host indicating the current state of the printer. It may be configured from 0 through 255. The default value is 0.

PC Parallel Interface

The PC Parallel interface (also referred to as the “Centronics**” interface) enables the printer to operate with controllers designed for buffered PC Parallel printers. The length of the data cable from the host computer to the printer must not exceed 15 feet (5 meters).

NOTE: For a more reliable data transfer, a maximum cable length of six feet is recommended.

Table 3. Printer PC Parallel Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
DATA LINE 1	2	ACKNOWLEDGE	10	CHASSIS GROUND	17
Return	20	Return	28		
DATA LINE 2	3	ONLINE/SELECT	13	GROUND (GND)	16, 30
Return	21	Fault	32		
DATA LINE 3	4	PAPER EMPTY	12	(NC)	34
Return	22	Return	30		
DATA LINE 4	5	BUSY	11		
Return	23	Return	29		
DATA LINE 5	6	NAUTO FEED	14		
Return	24				
DATA LINE 6	7	NINIT (PRIME)	31		
Return	25				
DATA LINE 7	8	NOT DATAPRODUCTS*	35		
Return	26				
DATA LINE 8	9	EXTERNAL 5 VOLTS	18		
Return	27				
DATA STROBE	1	N SELECT	36		
Return	19				
PAPER INSTRUCTION	15			* Used by DP adapter.	
Return	33				

PC Parallel Interface Signals

The PC Parallel interface signals between the host computer and the printer are defined as follows:

Data Lines 1 through 8 — Provide eight standard or inverted levels from the host that specify character, data, plot data, or function code. Data Line 8 allows access to the extended ASCII character set. You may enable or disable this line via the Data Bit 8 parameter on the System Interface Parameters and PC Parallel submenus.

Data Strobe — Carries a low true, 100 ns min. pulse from the host that clocks data into the printer.

Paper Instruction (PI) —Carries a VFU control signal from the host with the same timing as the data lines.

Acknowledge — A low true pulse from the printer indicating the character or function code has been received and the printer is ready for the next data transfer.

Online/Select — A high true level from the printer to indicate the printer is ready for data transfer and the **Start** key on the operator panel has been activated. When the printer is in Ready mode, it may accept data from the host.

Paper Empty (PE) — A high true level from the printer to indicate the printer is in a fault condition.

Busy — A high true level from the printer to indicate the printer cannot receive data.

PC Parallel Interface Configuration

Your printer is configured at the factory to match the interface you specified. By using the operator panel, you may verify and change several interface parameters in order to meet specific application requirements.

Refer to Chapter 4, “Configuration Menus,” for PC Parallel parameter descriptions and information on selecting values for the following parameters:

- Data Bit 8 (enable or disable)
- Data Polarity (standard or inverted)
- Strobe Polarity (standard or inverted)
- Response Polarity (standard or inverted)
- Busy on Strobe (enable or disable)
- Latch Data On Leading or Trailing Edge of Strobe
- Prime Signal (enable or disable)
- TOF Action at Prime Signal (do nothing or form feed)
- Buffer Size in kilobytes (1 to 16)

Some application programs require a unique configuration. If the printer is not working properly in the configuration you have selected, contact an IBM service representative.

IEEE 1284 Parallel Interface

The IEEE 1284 is a parallel interface with bidirectional capabilities. Features include the following:

- Faster data transmission. Timing of the signals has been reduced.
- Bidirectional communication. Both the host and the printer can send data.
- Versatility. If a device cannot send data along particular lines, the 1284 can work around this and send data via other operating modes, such as Nibble Mode which is discussed later.
- Less user interaction. The host can ask the printer about printing status and supported features, such as fonts and internal errors. For example, instead of having to physically check if the printer has run out of paper, you can create a program to query this from the host. The printer will respond and a message will display on the host.

Operating Modes

The 1284 supports three operating modes, which are determined by negotiation between the printer and the host.

Compatibility Mode

This mode provides compatibility with a Centronics or PC Parallel interface. Data is transferred from the host to the printer in 8-bit bytes over the data lines.

Compatibility Mode can be combined with Nibble and Byte Modes to provide bidirectional communication.

Nibble Mode

Eight bits equals one byte. When a byte of data is sent to the printer, the eight bits are sent over eight data lines.

Some devices cannot send data over their eight data lines. To bypass this, the 1284 permits data to be sent as half a byte over four status lines. (Half a byte equals one nibble.) Two sequential four-bit nibbles are sent over the lines.

Data is transferred from printer to host in four–bit nibbles over the status lines, and the host controls the transmission.

Byte Mode

The printer and host send data to each other along eight data lines (one bit per line).

If bidirectional communication is supported by the printer and the host, the host will take control of the data transfer.

The Negotiation Phase

The negotiation phase determines which operating mode will be used. At this time, the host and the printer will sense what devices are attached, the supported signals available, and which mode to use. The selected mode, in turn, defines the pins on the 1284 connector.

There are 36 pins on the parallel interface. Each one sends a different signal. Pin 1, for example, can send a Strobe signal or a HostClk signal, depending on the mode selected. Table 4 on page 129 shows the different definitions.

Signals

1284 interface signals between the host and the printer are defined below.

Host Clock / nWrite - Driven by host. Data transferred from host to printer. When printer sends data, two types are available. If Nibble Mode, signal is set high. If Byte Mode, signal is set low.

Data 1 through Data 8 - These pins are host-driven in Compatibility Mode and bidirectional in Byte Mode. They are not used in Nibble Mode. Data 1 is the least significant bit; Data 8 is the most significant bit.

Printer Clock / Peripheral Clock / Interrupt - Driven by the printer. A signal from the printer indicating the character or function code has been received and the printer is ready for the next data transfer.

Printer Busy / Peripheral Acknowledge / nWait - Driven by the printer. Indicates the printer cannot receive data. (Data bits 4 and 8 in Nibble Mode.)

Acknowledge Data Request / nAcknowledge Reverse - Driven by the printer. Indicates the printer is in a fault condition. (Data bits 3 and 7 in Nibble Mode.)

Xflag - Driven by the printer. A high true level indicating the printer is ready for data transfer and the printer is on-line. (Data bits 2 and 6 in Nibble Mode.)

Host Busy / Host Acknowledge / NDStrobe - Driven by the host. Activates auto-line feed mode.

Peripheral Logic High - Driven by the printer. When set to high, the printer indicates all of its signals are in a valid state. When set to low, the printer indicates its power is off or its signals are in an invalid state.

nReverse Request - Driven by the host. Resets the interface and forces a return to Compatibility Mode idle phase.

nData Available / nPeripheral Request - Driven by the printer. Indicates the printer has encountered an error. (Data bits 1 and 5 in Nibble Mode.)

1284 Active / nAStrobe - Driven by the host. A peripheral device is selected.

Host Logic High - Driven by the host. When set to high, the host indicates all of its signals are in a valid state. When set to low, the host indicates its power is off or its signals are in an invalid state.

nInit - Resets init interface from the host.

NOTE: The length of the data cable from the host computer to the printer should not exceed 10 meters (32 feet). For greater data reliability, use a cable of 1.8 meters (6 feet) or less.

Table 4. Printer 1284 Connector Signals

Pin	Source of Data	Type of Mode		
		Compatible	Nibble	Byte
1	Host	nStrobe	Host/Clk	Host/Clk
2	Host/Printer	Data 1 (LSB)		
3	Host/Printer	Data 2		
4	Host/Printer	Data 3		
5	Host/Printer	Data 4		
6	Host/Printer	Data 5		
7	Host/Printer	Data 6		
8	Host/Printer	Data 7		
9	Host/Printer	Data 8 (MSB)		
10	Printer	nAck	PtrClk	PtrClk
11	Printer	Busy	PtrBusy	PtrBusy
12	Printer	PError	AckDataReq	AckDataReq
13	Printer	Select	Xflag	Xflag
14	Host	nAutoFd	HostBusy	HostAck
15		Not Defined		
16		Logic Gnd		
17		Chassis Gnd		
18	Printer	Peripheral Logic High		
19		Signal Ground (nStobe)		
20		Signal Ground (Data 1)		
21		Signal Ground (Data 2)		
22		Signal Ground (Data 3)		
23		Signal Ground (Data 4)		
24		Signal Ground (Data 5)		
25		Signal Ground (Data 6)		
26		Signal Ground (Data 7)		

Table 4. Printer 1284 Connector Signals

Pin	Source of Data	Type of Mode		
		Compatible	Nibble	Byte
27		Signal Ground (Data 8)		
28		Signal Ground (PError, Select, nAck)		
29		Signal Ground (Busy, nFault)		
30		Signal Ground (nAutoFd, nSelectIn, nInit)		
31	Host	nInit		
32	Printer	NFault	nDataAvail	nDataAvail
33		Not Defined		
34		Not Defined		
35		Not Defined		
36	Host	nSelectIn	1284 Active	1284 Active

Terminating Resistor Configurations

The factory equips the printer with several resistors that are used for parallel interface configurations and are suitable for most applications. These 470 ohm pull–up and 1K ohm pull–down terminating resistors are located within the electronics of the machine and should be accessed only by an IBM Customer Service Representative.

If the values of these terminating resistors are not compatible with the particular interface driver requirements of your host computer, you may need to have a different resistor combination installed on your printer. You must call your printer service representative to have this situation addressed.

6 *Routine Service And Diagnostics*

Overview

This chapter discusses general cleaning, running diagnostic tests, and understanding fault messages.

The printer requires no routine maintenance beyond regular cleaning. Periodically remove excess paper chaff and dust from the ribbon and paper paths. If print quality or paper motion deteriorates seriously even after cleaning, contact your IBM service representative for prompt attention.

Cleaning Requirements

Periodic cleaning ensures efficient operation and clear print quality. If the printer is located in a dusty area or is used for heavy duty printing, clean it more often.

DANGER:

<2> Switch off printer power and unplug the printer power cord before cleaning the printer.

Cleaning The Outside Of The Printer

Clean the outside of the printer with a soft, lint-free cloth and mild detergent soap. Dishwashing liquid works well. Do not use abrasive powders or chemical solvents. Clean the windows with plain water or mild window cleaner.

ATTENTION

Always apply the cleaning solution to the cloth; never pour cleaning solution directly onto the printer.

Cleaning Inside The Printer

Over time, particles of paper, ink, and ribbon accumulate inside impact printers. This is normal. These particles must be removed periodically to avoid degraded print quality. Most paper particles accumulate around the ends of the platen and ribbon path.

To clean the interior of the printer, refer to Figure 66 (cabinet models) or Figure 67 (pedestal models) and perform the following steps:

1. Power off the printer and unplug the printer power cord.
2. Unload the paper (explained in the *Operator's Guide).*
3. Unlatch both ribbon spools and carefully lift them off the hubs. Raise the ribbon out of the ribbon path.
4. Using a soft-bristled non-metallic brush, remove paper, ribbon, and dust particles from the paper path, ribbon guides, and ribbon path.
5. Brush and vacuum accumulated paper, ribbon, and dust particles, especially in the tractor, hammer bank, and base pan areas.
6. Cabinet models: Brush and vacuum up dust or residue that has accumulated inside the lower cabinet.
7. Cabinet models: Wipe the lower cabinet interior with a clean, lint-free cloth dampened with water and mild detergent. Dry the lower cabinet interior by wiping it with a clean, dry, lint-free cloth.
8. Install the ribbon (page 47), load the paper (page 50), and set the top-of-form (page 61).

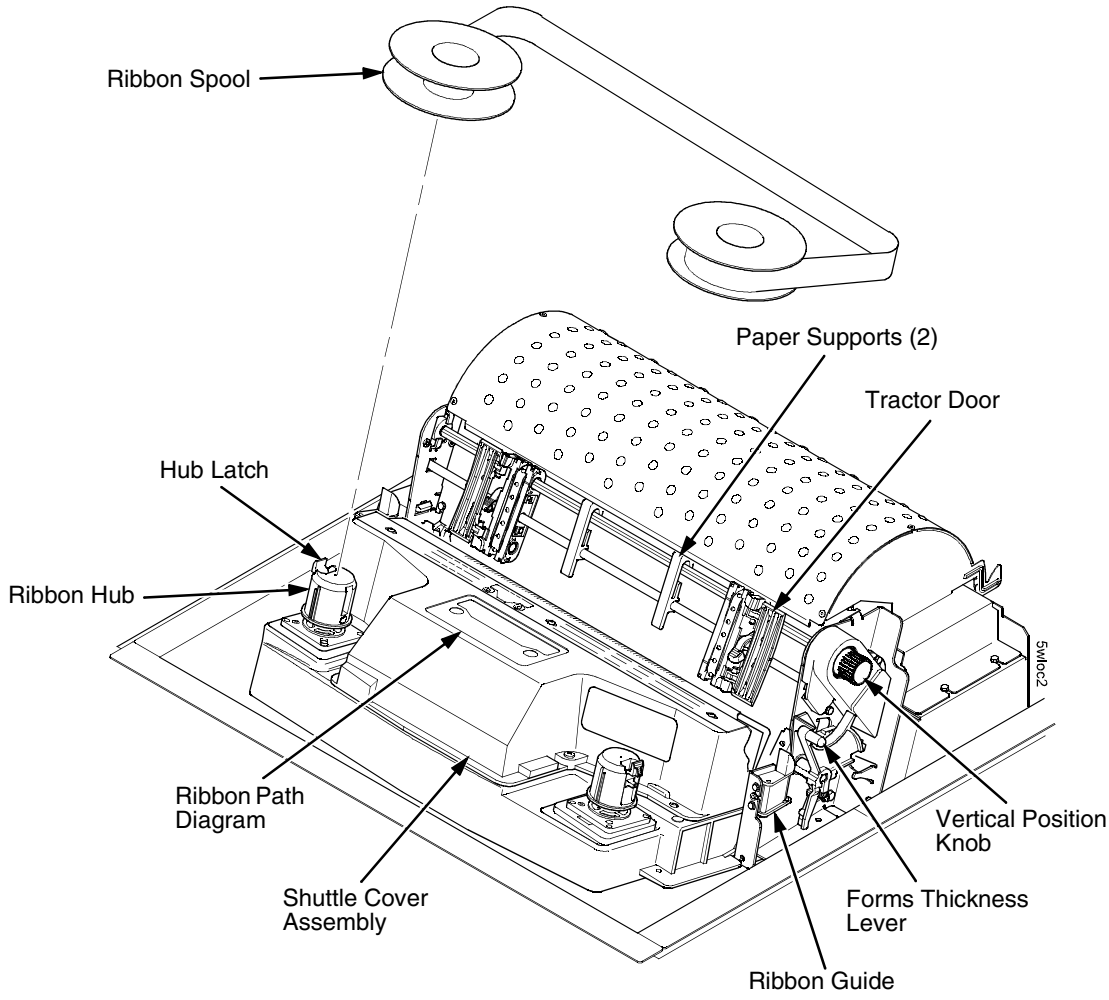


Figure 66. Cleaning the Printer, Cabinet Models

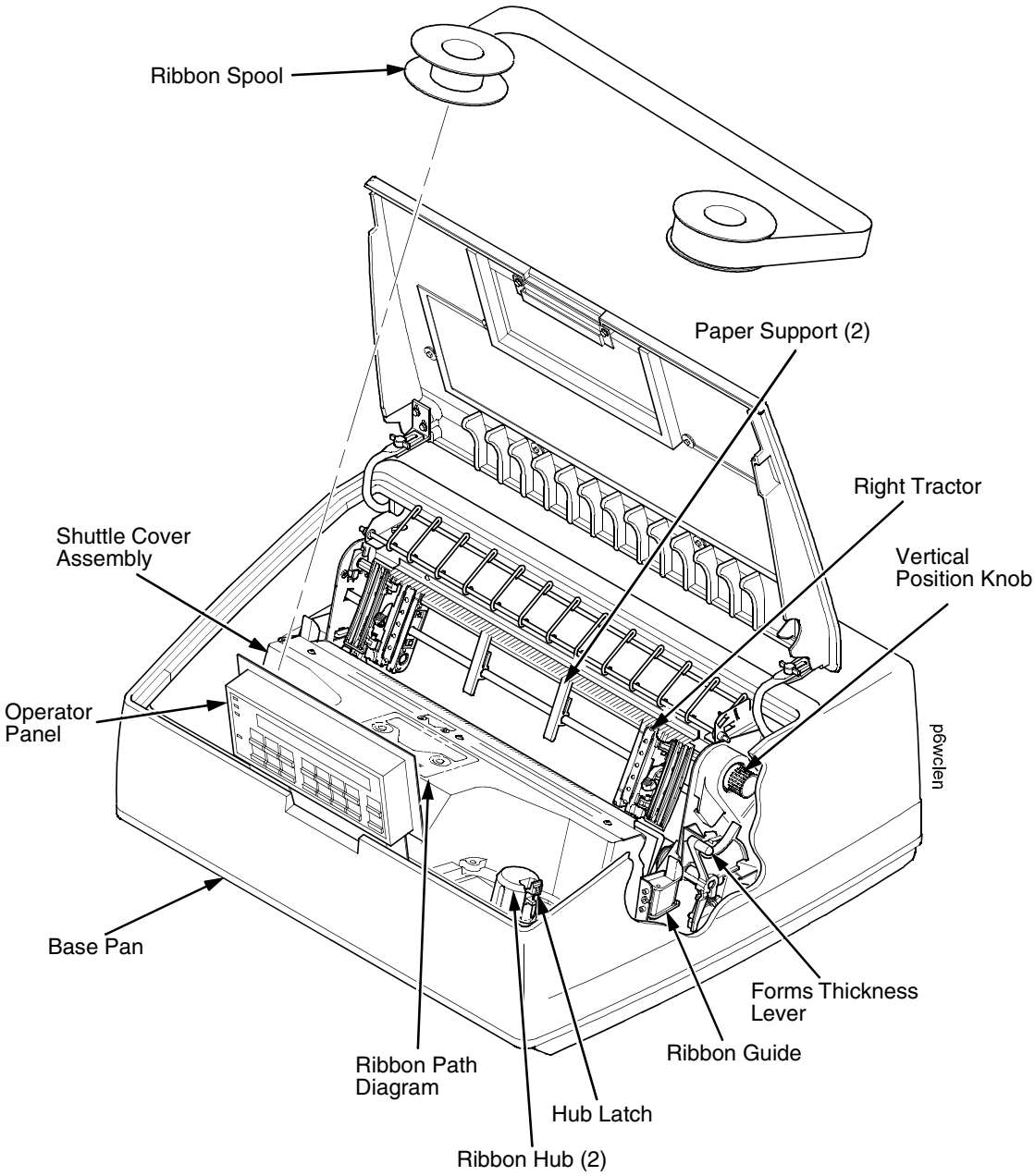


Figure 67. Cleaning the Printer, Pedestal Models

Printer Self-Tests

With the exception of testing the interface between the printer and the host computer (and the associated data cable), you do not need to send data from the host computer to the printer to test printer operation. You can use the printer built-in diagnostic tests to check many of the functions of your printer, including print quality and overall operation. These diagnostic tests include the following:

- **Printer Demonstration** — Demonstrates all the functions and features available on the printer.
- **Print Error Log** — This test prints the contents of the printer internal error log.
- **Ripple Print** — A “sliding” alphanumeric pattern used to identify missing or malformed characters, improper vertical alignment, or vertical compression.
- **All E’s** — A pattern of all uppercase letter E’s used to identify missing characters, misplaced dots, smeared characters, improper phasing, or light/dark character variations.
- **All H’s** — pattern of all uppercase letter H’s used to detect missing characters or dots, smeared characters, or improper phasing.
- **All E’s + FF (Form Feed)** — A pattern of all uppercase E’s repeated for ten lines and followed by a form feed to the next page top-of-form, used to identify paper motion or feeding problems, such as paper path obstruction or improper forms.
- **Underlines** — An underline pattern useful for identifying hammer bank misalignment.

NOTE: The Operator Print Test menu is displayed in Chapter 4, page 116

Hex Code Printout

A hex code printout (or hex dump) lists each data character received from the host computer, along with its corresponding two-digit hexadecimal code. Hex dumps can be used to troubleshoot some types of printer data reception problems.

Each printable character prints as its assigned symbol and as its hex equivalent. Each nonprintable character prints both as a period (.) and as its hex equivalent. Figure 68 shows a sample Hex Code Printout.

```
. . . . . .  00 01 02 03 04 05 06 07 08 09 0D 0A 0B 0C 0D 0A
. . . . . .  0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D
. .  ABCDEFGHIJKLM  1E 1F 20 41 42 43 44 45 46 47 48 49 4A 4B 4C 4D
NOPQRSTUVWXYZabc  4E 4F 50 51 52 53 54 55 56 57 58 59 5A 61 62 63
defghijklmnopqrs  64 65 66 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 73
tuvwxyz~!@#$%^&*  74 75 76 77 78 79 7A 7E 21 40 23 24 25 5E 26 2A
()_+1234567890-=  28 29 5F 2B 31 32 33 34 35 36 37 38 39 30 2D 3D
[]\;',./{}|:"<>?  5B 5D 5C 3B 27 2C 2E 2F 7B 7D 7C 3A 22 3C 3E 3F
. . . . . .  0D 0A 00 01 02 03 04 05 06 07 08 09 0D 0A 0B 0C
. . . . . .  0D 0A 0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B
. . . .  ABCDEFGHIJK  1C 1D 1E 1F 20 41 42 43 44 45 46 47 48 49 4A 4B
LMNOPQRSTUVWXYZa  4C 4D 4E 4F 50 51 52 53 54 55 56 57 58 59 5A 61
bcdefghijklmnopq  62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F 70 71
rstuvwxyz~!@#$%^  72 73 74 75 76 77 78 79 7A 7E 21 40 23 24 25 5E
&*()_+1234567890  26 2A 28 29 5F 2B 31 32 33 34 35 36 37 38 39 30
-=[]\;',./{}|:"<  2D 3D 5B 5D 5C 3B 27 2C 2E 2F 7B 7D 7C 3A 22 3C
>?. .  3E 3F 0D 0A
```

Figure 68. Sample Hex Code Printout

Fault Messages

If a fault condition occurs in the printer, the Attention indicator on the operator panel lights, and the first line of the operator panel message display indicates the fault. The second line of the display indicates how to clear the fault.

Table 5 explains each fault message and describes how to correct the fault condition. Displayed faults fall into one of two categories:

- Operator correctable
- IBM Customer Service Representative required to correct

Fault Correction Procedure

Before correcting a fault, read the fault explanation, then proceed to fix the problem, taking the following steps:

- Press any key except **Form Feed** or **Stop** to silence the alarm, if necessary.
- Write down the number of the error messages being displayed.
- Read the fault explanation in Table 5, then proceed to correct the fault.
- Press **Stop** to clear the fault message. Press **Start** to return to Ready mode, and resume printing.
- If the fault message reappears, power off the printer, wait 15 seconds, then power on the printer.
- Run your print job again. If the fault message reappears, power off the printer, then call IBM Customer Service. Otherwise, no further attention is required.

The following table explains each fault message and offers suggestions for correcting the fault condition.

Table 5. Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
001 END OF FORMS LOAD FORMS	**Yes**	**Printer is out of paper.**	**Load paper according to instructions on page 50.**
002 FORM JAMMED CLEAR AND RELOAD FORM	**Yes**	**No paper motion.**	**Clear paper jam and reload paper. See the *Operator's Guide.* Reset forms thickness lever.**
003 FORMS EJECTED PRESS EJECT/RESTORE	**Yes**	**Non-error status message.**	**Press Eject/Restore key to return paper to print position.**
004 VIEW FORMS PRESS VIEW KEY	**Yes**	**Non-error status message.**	**Press View key to return paper to print position.**
006 HOST REQUESTS ATTN	**Yes**	**Host attention message.**	**The host computer or printer controller requires attention.**
008 HOLD PRINT TIMEOUT PRESS START	**Yes**	**Printer was off-line more than 10 minutes and the "Intervention Required" parameter is set to "Send to Host."**	**Press Start to put printer in READY state.**
009 INVALID KEY PRESS	**Yes**	**Appears briefly if an inactive key is pressed in current print mode.**	**Re-enter the value, or press the correct key.**
010 PARAMETER ERROR	**No**	**Illegal parameter value received in command code.**	**Contact your system administrator.**

Fault Message	Operator Correctable?	Explanation	Solution
012 STRUCTURED FLD ERROR	No	Applications software has violated structured data field parameters.	Contact your system administrator.
021 BUFFER OVER VERIFY CONFIGURATION	Yes	Receive overrun. (Serial interface)	Check printer serial port configuration setup. Ensure that baud rate matches both host and printer settings.
024 SERIAL PARITY ERROR	Yes	Parity error. (Serial interface)	Check printer serial port configuration setup. Ensure that parity setting matches both host and printer settings.
025 SERIAL FRAMING ERROR VERIFY CONFIGURATION	Yes	Framing error. (Serial interface)	Check printer serial port configuration setup. Ensure that it matches host setting.
026 HEX DUMP MODE	N/A	Printer attach status message.	No action necessary.
029 8344 DIAGNOSTIC FAILED	No	Link-level code test detects hardware failure.	Contact IBM service.
031 END OF FORMS TIMEOUT LOAD FORMS	Yes	A timeout message is sent to the host if paper is not loaded 10 minutes after Stop was pressed to clear the paper out fault.	Load paper. See *Operator's Guide* for procedure.
032 FORMS JAMMED TIMEOUT CLEAR AND RELOAD FORMS	Yes	A timeout message is sent to the host if no paper motion has occurred for 10 minutes after Stop was pressed to clear the jam fault.	Clear paper jam and reload paper. See *Operator's Guide* for procedure.
034 RIBBON STALL TIMEOUT CHECK RIBBON	Yes	A timeout message is sent to the host if no ribbon movement has occurred for 5 seconds if Stop was not pressed to clear the fault.	Make sure the ribbon is not twisted and the forms thickness lever is set to match thickness of media being used. If fault reoccurs, contact IBM service.
041 BUFFER OVERFLOW	Yes	Host sends data after the printer buffer is full. (Serial interface.)	Check printer serial port configuration setup. Ensure that the Data Terminal Ready setting matches both host and printer settings.

Fault Message	Operator Correctable?	Explanation	Solution
042 NO CUSTOM SET AVAIL	Yes	This custom configuration set does not exist.	Save the custom set. Refer to page 84, "Saving Your Configuration in a Custom Set."
043 CUSTOM SET EXIST	Yes	Custom set is write-protected.	Delete existing set, then save new set. Refer to page 103 "Delete Custom Set."
044 EC FIRMWARE/HARDWARE ERROR	No	Fatal firmware error on the controller board.	Contact IBM service.
046 EC STOPPED AT STATE <state>	No	Controller self-test and initialization sequence was halted at <state>, where <state> is one of 10 numerically coded messages.	Contact IBM service.
056 HAMMER COIL OPEN SEE USERS GUIDE	No	Electrical malfunction of one or more hammer coils.	You can continue to print with degraded print quality. Contact IBM service.
057 CLOSE PLATEN	Yes	Forms thickness lever is raised to the open position.	Lower the forms thickness lever.
058 SHUTL JAM SEE USERS GUIDE	No	No shuttle movement or the shuttle is moving at the wrong speed.	Make sure the ribbon is not twisted and the forms thickness lever is set correctly. If the fault reoccurs, contact IBM service.
059 CANCEL PRINT ACTIVE	N/A	Non-error status message.	No action necessary.
060 PRINTER HOT SEE USERS GUIDE	No	Controller board sensors report high temperatures on the board.	Contact IBM service.

Fault Message	Operator Correctable?	Explanation	Solution
062 MACHINE CHECK SEE USERS GUIDE	**Yes**	**Sensors cannot detect current in fan circuit.**	**Power off the printer and remove paper guide assembly (for instructions, refer to your *IBM 6400 Maintenance Information Manual*). Check that the fan cable is connected. Check for obstruction of vents and fan airway; remove any obstructions. Check for items beneath the printer blocking cabinet vents. Power on the printer. If this message reoccurs, contact IBM service.** **NOTE:** This message should not appear on a Pedestal model. If this message does appear, contact IBM service.
065 HAMMER FAN CHECK* SEE USERS GUIDE	**Yes**	**Sensors cannot detect current in fan circuit.**	**Power off the printer and remove paper guide assembly (for instructions, refer to your *IBM 6400 Maintenance Information Manual*). Check that the fan cable is connected. Check for obstruction of vents and fan airway; remove any obstructions. Check for items beneath the printer blocking cabinet vents. Power on the printer. If this message reoccurs, contact IBM service.**
069 DATA CLEARED	**N/A**	**Appears when data is cleared out of printer after Cancel key has been pressed.**	**No action necessary.**
080 POWER SUPPLY HOT	**No**	**Circuits are overheating on the power supply board.**	**Contact IBM service.**

Fault Message	Operator Correctable?	Explanation	Solution
082 POWER 8.5 CHECK* SEE USERS GUIDE	No	Internal power failure.	Contact IBM service.
083 INTAKE FAN CHECK* SEE USERS GUIDE	Yes	Sensors cannot detect current in fan circuit.	Contact IBM service.
084 POWER 48V CHECK* SEE USERS GUIDE	No	Internal power failure.	Contact IBM service.
085 CONTROL VOLT CHECK SEE USERS GUIDE	No	Controller voltage failure.	Contact IBM service.
086 CONTROL 15V CHECK SEE USERS GUIDE	No	Controller voltage failure.	Contact IBM service.
087 PLATEN OPEN TIMEOUT CLOSE PLATEN	Yes	Forms thickness lever has been open for at least one minute.	Close forms thickness lever.
088 CONTROL 23.5V CHECK SEE USERS GUIDE	No	Controller voltage failure.	Contact IBM service.
089 RIBBON STALL CHECK RIBBON	Yes	No ribbon movement.	Make sure the ribbon is not twisted and the forms thickness lever is set to match thickness of media being used. If fault reoccurs, contact IBM service.
090 SHUTTLE COVER OPEN CLOSE SHUTTLE COVER	No	Shuttle cover is missing, damaged, or not correctly installed.	Contact IBM service.
092 RBN DRVR CIRCUIT* SEE USERS GUIDE	No	Controller board does not detect ribbon drive motor.	Contact IBM service.
101 UPPER DRIVER SHORT	No	Hammer driver circuits on the controller board shorted to ground.	Contact IBM service.
102 LOWER DRIVER SHORT* SEE USERS GUIDE	No	Circuit(s) on the hammer bank or in the hammer bank power cable shorted to ground.	Contact IBM service.
107 COIL HOT	No	One or more hammer coils are overheating.	Stop printing and allow the printer to cool for five minutes. If the fault reoccurs, contact IBM service.
110 STACK OVERFLOW* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
111 STACK UNDERFLOW SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
112 UNDEFINED OPCODE* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.

Fault Message	Operator Correctable?	Explanation	Solution
113 INSTRUCTION SET SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
114 ILLGL OPR ACCESS* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
115 ILLGL INSTR ACCESS* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
116 ILLGL EXTERNAL BUS ACCESS SEE OPER MANUAL	No	Fatal firmware error on the controller board.	Contact IBM service.
117 A TO D OVERUN* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
118 UNDEFINED INTERRUPT SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
119 TCB CORRUPTED* SEE OPERATOR MANUAL	No	Fatal firmware error on the controller board.	Contact IBM service.
120 ACCESS NULL POINTER* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
121 PAP NOT AT SPEED* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
122 PAP NOT SCHEDULED* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
123 PAP BUSY TOO LONG* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
124 PAP FIFO OVERFLOW* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
125 PAP FIFO UNDERFLOW* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
126 PAP FEED BAD TABLE* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
127 ILLEGAL STATE* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
128 INVALID COMMAND* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
129 INVALID PARAMETER SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
130 PAP FEED INCOMPLETE SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
131 UNEXPECTED INTERRUPT SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
132 INVALID COMMAND* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
133 INVALID STATE* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
134 INVALID COMMAND* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.

Fault Message	Operator Correctable?	Explanation	Solution
135 INVALID STATE* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
136 INVALID PARAMETER* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
137 SHUTL INVALID CMD* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
138 SHUTL INVALID PARM* SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
139 MACHINE CHECK SEE USERS GUIDE	No	Fatal firmware error on the controller board.	Contact IBM service.
990 MACHINE CHECK	N/A	Host status message.	No action necessary.
NON-VOLATILE MEMORY FAILED	No	Non-volatile memory fault.	Contact IBM service. NOTE: You can still print, but you cannot save configuration changes as the NVRAM is defective.
A97 GRAPHIC CHECK ERROR PRESS STOP THEN START	Yes	Printer has received a non-printable character.	Press Stop then Start.
ENERGY SAVER MODE ACTIVE	N/A	Status message: printer is in low-energy idle state, all fans and higher voltages are off, only +5Vdc logic circuits are active.	No action necessary. NOTE: If the printer was in NOT READY state when the energy saver mode was activated, it will remain in the NOT READY state until the START key is pressed.
HAMMER COIL BAD #, #, #	No	Malfunction of one or more hammer coils.	(You can continue to print with degraded print quality.) Contact IBM service.
NOT READY	N/A	Printer state message: printer is offline, not in communication with host.	No action necessary.
OPERATOR MENU <first menu item>	N/A	Non-error status message.	No action necessary.
OPERATOR MENU LOCKED	N/A	Non-error status message.	No action necessary.
OPERATOR MENU UNLOCKED	N/A	Non-error status message.	No action necessary.
P05 DIAGNOSTIC TEST PASSED	N/A	Non-error status message.	No action necessary.
P17 SECURITY VIOLATION	No	Security code of PAL on controller board does not match code of firmware on the controller board.	Contact IBM service.

Fault Message	Operator Correctable?	Explanation	Solution
PLEASE WAIT... RESET IN PROGRESS	N/A	Printer reset in progress.	No action necessary.
READY	N/A	Printer state message: printer is online and in communication with host.	No action necessary.
RIBBON INK OUT CHANGE RIBBON	Yes	RibbonMinder has determined that the ribbon is out of ink.	Replace the ribbon and verify ribbon life is reset to 100%.
SERVICE MENU <first service test>	N/A	Non-error status message.	No action necessary.
TESTING HARDWARE PLEASE WAIT	N/A	Status message when printer runs self-tests and initialization routines.	No action necessary.
TOP OF FORM SET	N/A	Non-error status message.	No action necessary.

7 RibbonMinder

Overview

RibbonMinder is a user definable software feature that determines when a ribbon should be changed. It does this by monitoring ink consumption and alerts you when the print quality may fall below a level that you designate. This is especially important if you are printing bar codes to be scanned. This chapter explains how RibbonMinder works and how to configure it to meet your specific print job requirements.

Like the fuel gauge in your car, RibbonMinder indicates how much usable ink remains in the ribbon. The “gauge” for RibbonMinder is the message display on the control panel. The following message is typical for a new ribbon (100% full):

READY	PAR./ASC	100%

As printing continues, the percentage of usable ink in the ribbon decreases (percentage ranges from 100% through -99%):

READY	PAR./ASC	74%

Ribbon ink being consumed

READY	PAR./ASC	8%

Ribbon life approaching end

When 0% usable ink appears, the printer is typically configured to stop printing and display the following message:

RIBBON OUT OF INK CHANGE RIBBON

Configuring The RibbonMinder

This section explains how to unlock the PROGRAM MODE, find the RibbonMinder options, make changes, exit the configuration menu, and lock the PROGRAM MODE.

Following this section is a procedure for changing the Ribbon Size option of RibbonMinder.

NOTE: All RibbonMinder options are automatically saved in NVRAM when selected.

As you perform the following steps, refer to the RibbonMinder menu diagram shown in Figure 69.

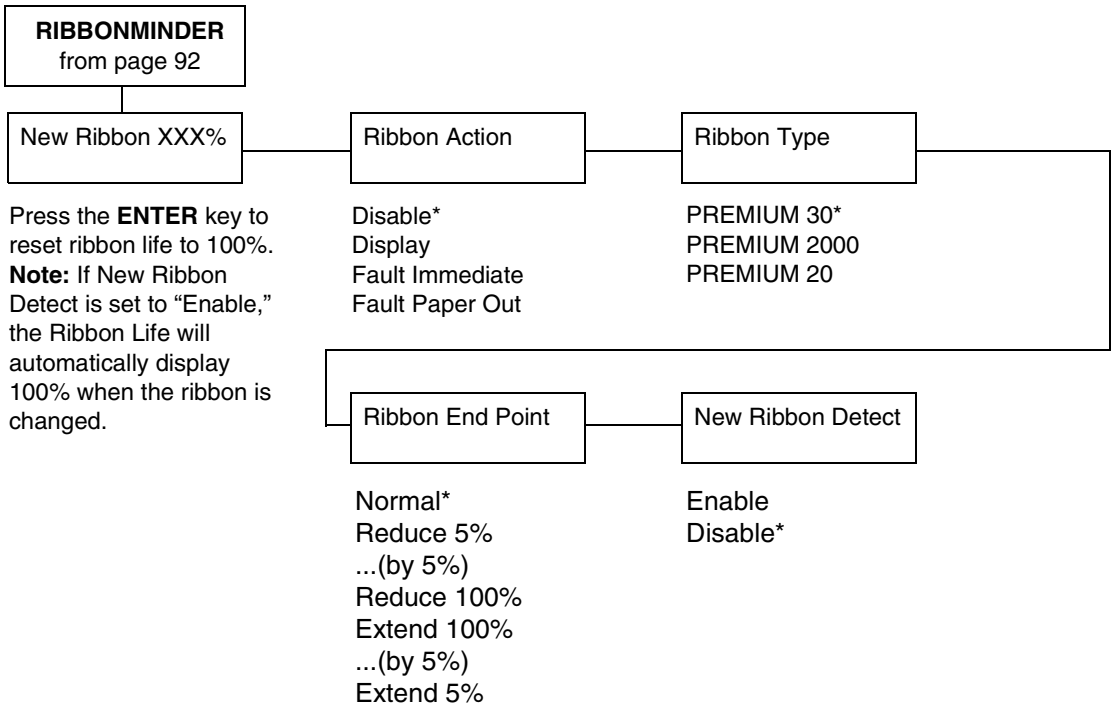


Figure 69. RibbonMinder Menu Diagram

Running A Job

Once you have set up options for RibbonMinder, it works without attention. When you begin printing with RibbonMinder enabled and Ribbon Action set to DISPLAY, the message display shows a ribbon life value of 100%. The ribbon life decreases as the ink is consumed.

New Ribbon

The New Ribbon option provides information concerning the percentage of ribbon used and allows you to reset the ribbon life when you replace a worn ribbon. To reset the ribbon life from the operator panel, press **Enter** while this option is displayed. It may be necessary to replace ribbons before the ink has been depleted (e.g., when the ribbon has been snagged, folded, or otherwise damaged).

Ribbon Action

A fault message displays when the ink consumption reaches 0%.The Ribbon Action option allows you to perform any of the three following functions:

- DISABLE does not display the RibbonMinder ink consumption percentage. The percentage is calculated but not displayed.
- DISPLAY allows you to view the RibbonMinder ink consumption display. A fault message displays when the ink consumption reaches 0%.
- FAULT IMMEDIATE displays an error message, which is Ribbon Ink Out, Change Ribbon, when the RibbonMinder consumption percentage falls to zero. The error message can be cleared and printing can continue for approximately another two minutes.

  After the two–minute period has elapsed, the fault will reoccur if the Ribbon Action remains set on FAULT. If the Ribbon Action is changed to DISABLE or DISPLAY within the two–minute period, the fault will not reoccur.
- FAULT PAPER OUT allows you to continue printing despite ribbon life reaching 5% until the printer runs out of paper. When the End Of Forms/ Load Forms condition is cleared (paper is loaded), then the Ribbon Ink Low/Change Ribbon message appears

If you do not want to change the ribbon at this time, you may disable RibbonMinder. If the ribbon is worn, the “Change Ribbon” message will reappear once the function is enabled again until the ribbon is changed. If a fault message is displayed on the control panel and New Ribbon Detect is set to Enable, the ribbon percentage automatically resets back to 100% when the ribbon is changed.

If the message display indicates the need to install a new ribbon and your print job is one page short of completion, press **Stop** and then **Ready** to clear the fault and print the last page. Otherwise, you may continue your print job at the end of this procedure. The fault will occur again two minutes after clearing the fault.

Ribbon Type

RIBBON TYPE specifies the type of the ribbon installed. When installing or replacing a ribbon, you can adjust the ribbon type by using the Ribbon Type option.

The default ribbon type is PREMIUM 30.

Press the **Scroll**↑ and **Scroll**↓ keys to select the ribbon type.

Ribbon End Point

RIBBON END POINT allows the printing of more or less pages before the display reaches 0%.

- Normal - 0% (default)
- Reduce 5% through 100% in increments of 5% allows you to lower the life expectancy of the ribbon installed.
- Extend 100% through 0% in increments of 5% allows you to increase the life expectancy of the ribbon installed.

Pressing the **Scroll**↑ key increases the percentage, while pressing the **Scroll**↓ key decreases the percentage.

New Ribbon Detect

NEW RIBBON DETECT selects the way the fault message will be reset.

- ENABLE, the Ribbon Out of Ink, Change Ribbon fault will be reset when the platen is opened. Opening the platen will also reset the ribbon life to 100%.
- DISABLE (the default), the ribbon life may only be reset using the new ribbon menu option.

A Printer Specifications

Ribbon Specifications

NOTE: The ribbon life figures listed below are based on IBM tests conducted in accordance with ANSI Standard X3A.182. Actual ribbon life may vary depending upon the user quality criteria, printer condition, machine settings, paper quality, and bar code requirements. Label yield depends on label format, bar code symbology, and other parameters. Label yield with high-performance scanning equipment may exceed these yields. Use only the ribbons listed below.

6400-i Premium 30 Ribbon **P/N 57P2308**

Ordering Ribbons

Order supplies by contacting your local Lexmark International distributor or contacting:

Pacific Logic Trading Company Limited
Room B327 3/F, Da hua Plaza NO. 171
Haidian Road
Haidian District, Beijing, China
Post Code: 100086

Phone: 010-62636812
Fax: 010-62636813

Paper Specifications

NOTE: The following paper specifications are general guidelines. Paper stock should be tested with applications to determine print quality.

Paper

Type: Edge-perforated, fan-fold, 3 to 17 inches (7.62 to 43.18 cm) wide*, 2 to 24 inches (5.08 to 60.96 cm) long**

Single-part: 15 pound (57 g/m^2) to 100 pound (377 g/m2) stock.

Multi-part carbon: 1- to 6-part forms, maximum 12 pound (45 g/m^2) ply of upper plies.

Multi-part carbonless, maximum of 6-part forms. Test readability of greater than 4-part forms.

Form Thickness: 0.025 inches (0.064 cm) maximum

Drive: Adjustable tractors (6-pin engagement)

Slew Rate:

6400-D3P	6400-D3C	6400-D6P	6400-D6C	6400-D8P	6400-D8C
16 ips	20 ips	16 ips	25 ips	25 ips	32 ips

Labels

On Backing: One-part continuous perforated fan-fold back form. Labels must be placed at least 1/6 inch (0.42 cm) from the fan-fold perforation. Backing adhesive must not be squeezed out during printing.

Sheet Size: 3 to 17 inches (7.62 to 43.18 cm) wide*, including the two standard perforated tractor feed strips. A maximum sheet length of 16 inches (40.64 cm) between top and bottom perforations.**

Thickness Not to exceed 0.025-inch (0.064 cm), including backing sheet.

*On pedestal models, when using the rear paper exit, the maximum form width is 16 inches (40.64 cm).

**On cabinet models, forms longer than 12 inches can be used by opening the front and rear printer doors.

Printer Dimensions And Weight

Cabinet Models

Height: 42.5 inches (108.0 cm)

Width: 27 inches (68.6 cm)

Depth: 29 inches (73.7 cm)

Weight: 215.6 lbs. (98 kg) unpacked
264 lbs. (120 kg) packed

Pedestal Models

Height: 35.0 inches (88.9 cm)

Width: 24.6 inches (62.5 cm)

Depth: 20.7 inches (52.6 cm)

Weight: 107.8 lbs. (49 kg) unpacked
154 lbs. (70 kg) packaged

Environmental Characteristics

Temperature

Operating: 50° to 104° F (10° to 40°C)

Storage: -40° to 158° F (- 40° to 70°C)

Relative Humidity

Operating: 15% to 80% (noncondensing)

Storage: 15% to 90% (noncondensing)

Acoustic Noise Level

Acoustic Noise Levels per ISO 9296	6400-D3P	6400-D6P	6400-D8P	6400-D3C	6400-D6C	6400-D8C
Printing	65 dBA	68 dBA	68 dBA	50 dBA	52 dBA	52 dBA
Standby	46 dB	46 dB	46 dBA	46 dB	46 dB	46 dBA

NOTE: Cabinet model noise levels listed are with the cabinet doors closed. Levels will be higher if the doors are open.
Pedestal model noise levels listed are for rear paper exit. Levels will be higher for top paper exit.

Electrical Characteristics

Input Voltage

Line Voltage Design Range	Line Frequency	RMS Current		
		6400-D3X	6400-D6X	6400-D8X
88-140 V RMS	47-63 Hz	6A @ 100V	8A @ 100V	9A @ 100V
178-270 V RMS	47-63 Hz	3A @ 200V	5A @ 100V	9A @ 200V

Power Consumption

Operating Mode	Units	Power Consumption		
		6400-D3X	6400-D6X	6400-D8X
Standby[1]	Watts	30 (60)	45 (80)	85
	BTU/Hour	100 (205)	154 (273)	289
Nominal[2]	Watts	220	310	450
	BTU/Hour	750	1058	1531
Maximum[3]	Watts	315	440	650-900
	BTU/Hour	1075	1500	2211-3062

[1]Numbers represent consumption in Power Saver Mode.
Numbers in parenthesis represent standby mode.

[2]Nominal power measured at 120 VAC while printing ASCII Shift-Recycle

[3]Maximum power measured at 120 VAC while printing Black Plot.

Interfaces

Type:	Three resident parallel, two resident serial.
Logic Levels:	TTL/EIA-232-E, EIA-422-B
Data Format:	ASCII
Compatibility:	EIA-232-E, EIA-422-B, PC Parallel, Dataproducts, IEEE 1284
Transfer Rates:	Up to 200K bytes/sec on parallel interfaces Up to 19.2K baud on RS-232 serial interfaces Up to 115,200 baud on RS-422 serial interfaces
Buffer:	16 kilobytes on serial interfaces 16 kilobytes on parallel interfaces

Cables

A power line cord is provided with the printer, but no data cables. The following provides data cable requirements and ordering information.

ASCII Serial/Parallel: The 6400-D Series printer is connected to personal computers and controllers via industry standard EIA-232-E and PC-parallel printer cables. For Dataproducts interfaces, you will need to obtain a Dataproducts cable. Contact your IBM service representative to order the following:

- EIA-232-E Cable
- PC-Parallel Cable

AS/400: The 6400-D Series is connected to the AS/400 ASCII Workstation Controller via the following IBM cables, available through your IBM service representative:

- 20 ft. RS-232
- 40 ft. RS-232

RISC System/6000: For RS-232 attachment to the IBM RISC System/6000, the following are required:

- IBM Async cable EIA-232/V.24
- Printer/terminal interposer EIA-232
- Serial Cable Kit (PN 12H1204)

Printing Rates

The printing speed of text is measured in lines per minute (lpm), and is a function of the selected font and the vertical dot density. Printing speed is independent of the number of characters configured in the character set repertoire. Print rates for lines containing attributes such as bold or emphasized printing, superscripts, subscripts, or elongated attributes will decrease to not less than half the rates of the font without such attributes. The exact print rate of lines containing these attributes depends on the specific print job, but software maximizes the throughput by dynamically determining which dot rows contain adjacent dots and must be printed in two strokes. Table 6 and Table 7 list typical printing rates.

The reverse paper feed capability allows the printing of multiple densities on a single line. This is useful in printing forms and text together or in mixing different fonts on a print line. Use of multiple densities and reverse paper feed also affects throughput.

Table 6: DBCS Printing Rates

PRINT QUALITY	Print Rate (lpm)		
	6400-D3P/D3C	6400-D6P/D6C	6400-D8P/D8C
LQ (with HIGH DENSITY = ON)	90	161	195
LQ (with HIGH DENSITY = OFF)	177	315	390
NEAR LQ	195	348	430
NORMAL	221	390	485
HI-SPEED	258	460	570
SUPER HI-SPEED	340	603	745
ULTRA HI-SPEED	367	655	805

Table 7: ASCII Printing Rates

PRINT QUALITY	Print Rate (lpm)		
	6400-D3P/D3C	6400-D6P/D6C	6400-D8P/D8C
LQ (with HIGH DENSITY = ON)	208	342	457
LQ (with HIGH DENSITY = OFF)	245	436	537
NEAR LQ	275	493	604
NORMAL	292	522	645
HI-SPEED	365	654	799
SUPER HI-SPEED	439	784	961
ULTRA HI-SPEED	490	784	968

Printing rates also vary according to the print quality you select. For example if you select the NEAR LQ option, the printer uses more dot rows and slower print strokes to form characers than if you choose the HI-SPEED option. Character formation and print speed are faster in HI-SPEED because the printer uses fewer dot rows to form characters.

B A Quick Look At Line Matrix Printing

Character Formation

The IBM 6400-D Series is an impact printer: it creates characters by printing ink dots on paper. Dots overlap to produce a solid–appearing character of uniform density. The dots are made by an assembly of steel hammers mounted on a rapidly oscillating shuttle. The hammers strike the paper through a moving ink ribbon. The dot patterns of characters are mapped in printer memory on invisible matrices, as shown in Figure 70.

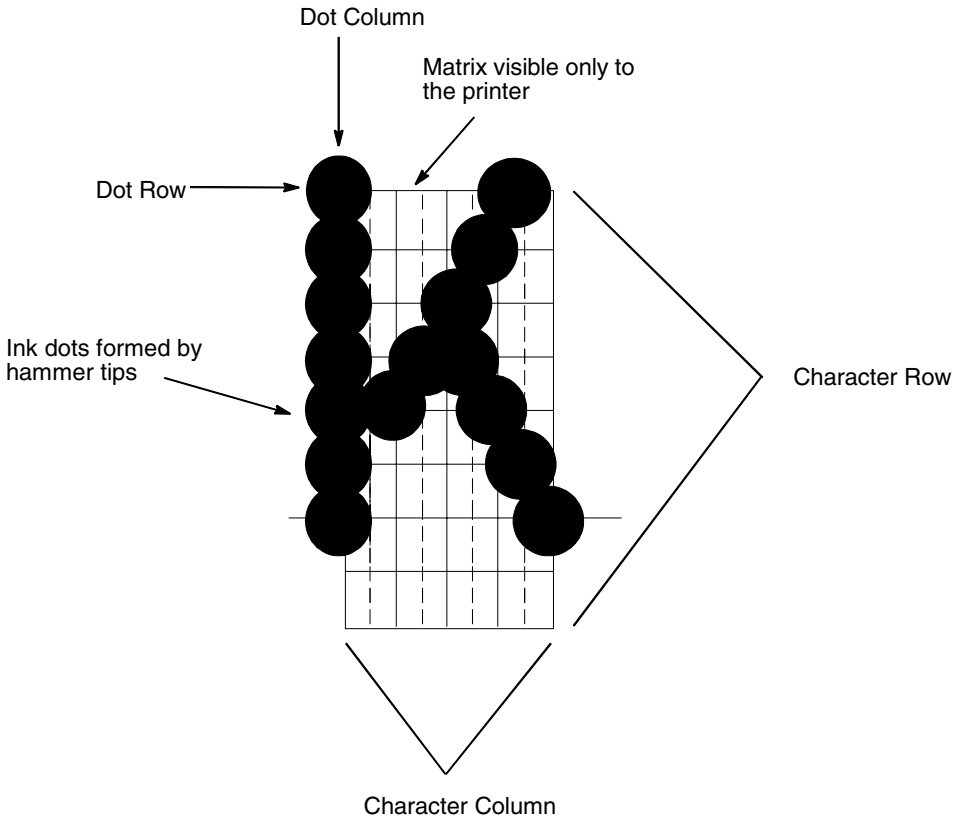


Figure 70. Typical Character Formation

Serial matrix printers use a moving printhead with pins to form single characters sequentially along the printed line. Unlike serial matrix printers, line matrix printers divide every printable line into horizontal dot rows, then print a dot row of the entire line at every lateral sweep of the shuttle. The IBM 6400-D Series is a line matrix printer.

During each sweep of the shuttle, hammers are activated to print dots at the required positions in the dot row. When the shuttle reaches the end of a sweep, it reverses direction, and the paper advances one dot row. The hammers print the next row of dots as the shuttle sweeps in the opposite direction, as shown in Figure 71, unless unidirectional printing is chosen.

After a line of characters is printed, the paper advances to the first dot row of the next print line. This creates a number of blank rows between lines of characters, depending on the print mode and line spacing you selected.

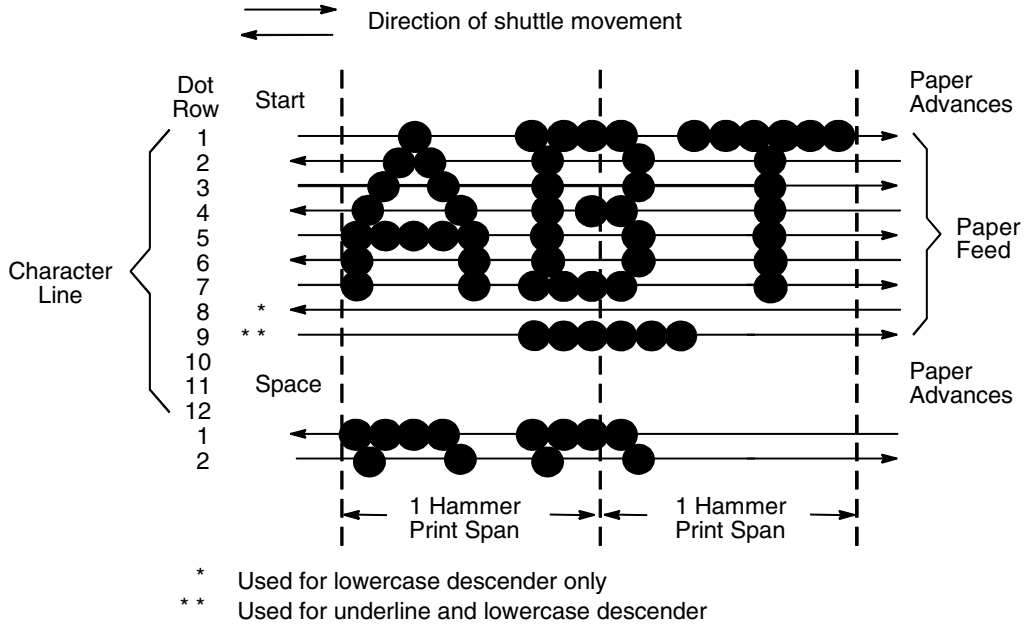


Figure 71. Line Matrix Printing

Printing Speed

The speed of text printing is measured in lines per minute (lpm). This speed is dependent upon the number of dot rows required to produce a line of characters, regardless of the number of characters in the line. Because more dot rows are required to print lowercase characters with descenders, those character lines will print at a fractionally lower rate.

In addition to character printing, the printer can plot dot–addressable graphic images. The speed of graphics plotting is measured in inches per minute (ipm). Unidirectional plotting can produce better print quality and takes about twice as long as bidirectional plotting. You can select either plotting mode from the operator panel or from the host computer.

Printing rates also vary according to the print quality you select. For example, if you select the Near Letter Quality (NLQ) option, the printer uses more dot rows and slower print strokes to form characters than if you choose the Draft Quality option. Character formation and print speed are faster in Draft Quality because the printer uses fewer dot rows to form characters.

Printing rates are listed in Appendix A.

Notices

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