IBM

6400i Line Matrix Printers

Setup Guide

Cabinet and Pedestal Models

S544-5640-04

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Fifth Edition (May 2003)

This edition replaces S544-5640-03.

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Safety Notices

 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.

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

<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.

CAUTION:

This product is equipped with a 3-wire power cord and plug for the user's safety. Use this power cord in conjunction with a properly grounded electrical outlet to avoid electrical shock.
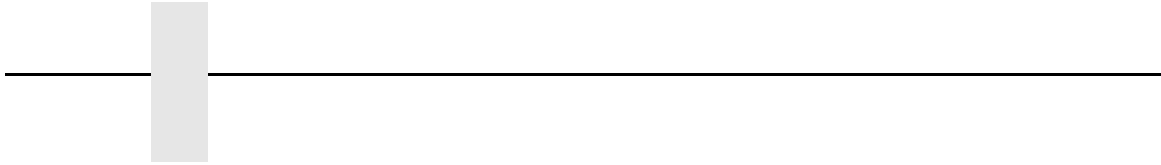
Table of Contents

1   *Introduction*

About This Setup Guide

This *Setup Guide* is designed so that you can quickly install and configure your IBM 6400 printer.

Notes And Notices

For your safety and to protect valuable equipment, it is very important that you read and comply with all information noted in the following section:

DANGER

<#>	The word Danger next to the lightning slash indicates the presence of a hazard that could cause death or serious personal injury. Danger and Caution notices are numbered to help you find the translated versions in the *IBM 6400 Safety Notices* booklet.

CAUTION

<#>   The word Caution next to the exclamation point (!) indicates the presence of a hazard that could cause moderate or minor personal injury.

CAUTION

<#>   The word Caution next to this symbol indicates a part or assembly that is hot enough to burn you.

 CAUTION

<#> The word Caution next to this symbol indicates a part or assembly that is sharp enough to cut you.

ATTENTION

The word Attention indicates the possibility of damage to a program, device, system, or data.

IMPORTANT

The word Important indicates information vital to proper operation of the printer.

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

Conventions In This Setup Guide

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.
Example: Press the **CLEAR** key, then press the **ON LINE** key.

Quotation marks (" ") indicate messages on the Liquid Crystal Display (LCD). For example:
Example: Press the **ON LINE** key. "OFFLINE" appears on the LCD.

Related Documents

- *Maintenance Information Manual* — Explains how to maintain and repair the line matrix printer at the field service level of maintenance.

- *Coax/Twinax Programmer's Reference Manual* — Covers the host control codes and character sets for the Coax and Twinax emulations.

- *LinePrinter Plus Programmer's Reference Manual* — Covers the host control codes for the LinePrinter Plus emulation.

- *IGP Programmer's Reference Manual* — Provides information used with the optional IGP emulation enhancement feature.

- *Code V Programmer's Reference Manual* — Provides information used with the optional Code V™ emulation enhancement feature.

- *ANSI Programmer's Reference Manual* — Provides host control codes and character sets for the ANSI emulation.

- *IPDS Twinax Emulation Programmer's Reference Manual* — Provides an overview of Intelligent Printer Data Stream™ (IPDS) features, commands, and diagnostics.

- *Character Sets Reference Manual* — Information about and examples of the character sets available in line matrix printers.

- *Ethernet Interface User's Manual* — Information about network protocols, configuration, and operation.

The IBM 6400 Printer Family

The IBM 6400 series consist of 500, 1000, 1500, 2000, and 2400 lines per minute (lpm) models and are packaged in various configurations. All of the models offer software versatility and the latest refinements in line matrix printing technology. The print mechanisms are housed in sound-insulated cabinets which make the printer family among the quietest printers in the world. Additionally, your printer has a flexible architecture that allows you to add new features and emulations as they become available.

LinePrinter Plus® is the standard emulation. LinePrinter Plus includes the Epson® FX-1050, Printronix® P-Series, P-Series XQ, Serial Matrix and Proprinter® III XL emulations. Coax/Twinax, IPDS™, ANSI® and the IGP®/ PGL® and IGP/VGL graphics enhancement emulations are available as optional upgrades. No matter what emulation is installed, your printer is easy to use. The message display and lights on the control panel communicate with you directly and clearly. You can select every function on your printer at the control panel, or you can send commands from the host computer.

The printer combines the use of Flash, RAM, and nonvolatile RAM for program execution. The Flash is used for all program, font, and emulation storage. New fonts, emulations, or program updates can be downloaded to Flash memory via the parallel or serial interface, or through the PrintNet® interface. The RAM is used for buffers, print image storage, and execution variables. The non-volatile RAM stores configuration, statistics, and internal parameters.

The printer model numbers indicate printing speed and physical configuration.

- All printer models start with the 6400 series prefix, followed by a three digit or alphanumeric suffix. Models containing only numbers indicate cabinet models. Model numbers containing the letter "P" indicate pedestal models.

- For cabinet models, the alphanumeric suffix refers to the printer's maximum speed in lines per minute (lpm): i05 for 500 lpm, i10 for 1000 lpm, i15 for 1500 lpm, i20 for 2000 lpm, and -i24 for 2400 lpm.

- For pedestal models, the first two alphanumeric values in the suffix refer to the printer's maximum speed in lines per minute (lpm): i5P for 500 lpm and i1P for 1000 lpm.

- The 6400-i5P and i1P models are pedestal models with the QuickAccess Cover installed.

- The 6400 i20, i2s, and i24 models are available with the power stacker option installed.

Refer to the following table for a complete listing of model numbers and options.

Table 1: 6400-i05, -i5P, -i10, -i1P, -i15, -i20, -i2s, i24 Printers

Model Number	Print Speed	Cabinet	Pedestal	Hammer Bank	Quick Access	Power Stacker
6400-i05	500 lpm	X		28 Hammers		
6400-i5P	500 lpm		X	28 Hammers	X	
6400-i10	1000 lpm	X		60 Hammers		Available as option
6400-i1P	1000 lpm		X	60 Hammers	X	
6400-i15	1500 lpm	X		102 Hammers		Available as option
6400-i20	2000 lpm	X		156 Hammers		Available as option
6400-i2s	2000 lpm	X		126 Hammers		Available as option
6400-i24	2400 lpm	X		156 Hammers		Available as option

Standard Capabilities

The 6400 printer family has the following general characteristics:

- A broad range of print speeds in both cabinet and pedestal models
- Support of 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 printers.

Host Computer Interfaces

- RS 232 Serial
- RS 422 Serial
- PC Parallel
- Dataproducts Parallel
- Ethernet Interface
- IEEE 1284

Coax/Twinax features are available with this printer:

- IBM Coax/Twinax

Printer Emulations

Each emulation provides a different set of configuration menus, control codes, and character sets. The following printer emulations (or protocols) are standard, and selectable at the operator panel:

- Proprinter III XL Emulation
- Epson FX Emulation
- P-Series Printer Emulation
- P-Series XQ Variant Printer Emulation
- Serial Matrix Printer Emulation

Proprinter III XL and Epson FX Emulations

The Proprinter III XL and Epson FX emulations are industry standard printer emulations.

P-Series Printer Emulation

This code system was developed especially for line matrix printers. As line matrix printers became more sophisticated, this code system kept pace by adding codes that fully utilized line matrix printer capabilities.

IMPORTANT

This emulation appears as "P-Series" on the operator panel.

P-Series XQ Variant Printer Emulation

This code system was devised for a series of printers manufactured between 1974 and 1991, that are no longer available.

IMPORTANT

This emulation appears as "P-Series XQ" on the operator panel.

Serial Matrix Printer Emulation

This printer emulation is very similar to the code systems used by an IBM Graphics Printer, but incorporates several systems into one emulation. This emulation enables a line matrix printer to print files coded for a serial matrix printer, and is sometimes referred to as the Serial Matrix collection.

IMPORTANT

This emulation appears as "Serial Matrix" on the operator panel.

NOTE: Serial matrix refers to the way printer characters are formed. A moving printhead uses pins to form whole characters one at a time and one after the other. The pins print dots according to programmed matrix patterns. Data is sent to the printer through either a serial or parallel interface, but the printhead must receive the data serially to form each character.

An IBM line matrix printer also forms characters with dots in matrix patterns, but it feeds print data in parallel to many hammers mounted on a rapidly oscillating shuttle. The hammers fire simultaneously to print entire lines at a time.

Output Control

The printers have the following output control features:

- Six modes for printing text:
    - Near-Letter Quality (NLQ)
    - Near-Letter Quality San Serif
    - Data Processing (DP)
    - Draft
    - Optical Character Recognition Font A (OCR A)
    - Optical Character Recognition Font B (OCR B)

OCR A and OCR B support 120 and 180 PEL, with 120 PEL the default value.

- Selectable forms length and width
- Character attribute specification:
    - 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:

- Three built-in graphics generators:
    - IBM Proprinter III XL bit-image graphics
    - Epson FX dot graphics mode
    - P-Series Plot
- Programmable electronic vertical formatting provides rapid vertical paper movement to specified lines for printing repetitive and continuous forms. You can use the following methods:
    - Vertical tabbing in Serial Matrix, Proprinter III XL, and Epson FX emulation modes
    - Electronic Vertical Format Unit (EVFU) in P-Series emulation mode

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 Features

The following features can be ordered and installed on this printer. 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.

- IBM Coax/Twinax Attachment:

  Enables you to attach this printer to IBM host systems, such as an iSeries or zSeries Host System. This feature also helps you to replace IBM coax/twinax printers such as the IBM 3262 Models 3 and 13, IBM 4234 Models 1, 2, and 9, and IBM 5224 Models 1 and 2. This feature can be used with the Intelligent Printer Data Stream (IPDS) feature which is described below.

- IBM Intelligent Printer Data Stream Coax/Twinax:

  Provides the ability to create forms, overlays, and graphics. IPDS also provides compatibility when replacing printers such as the IBM 4234 Models 12 and 11. This feature also supports many versions of the Print Services Facility* (PSF*). This feature requires the IBM Coax/Twinax or Ethernet card attachment.

- Code V:

  This is an implementation of the Intelligent Graphics Processor architecture and is used commonly to create graphics for optical character recognition and bar codes. This feature is also designed for those applications which use the Quality Micro Systems, Inc. graphics language, which is often referred to as the QMS Code V Magnum emulation and those applications that use the Code V Graphics Language. The Code V Graphics Language is often referred to as VGL.

- IGP:

  This is an implementation of Intelligent Graphics Processor architecture and is used commonly to create graphics for optical character recognition and bar codes. This feature is also designed for those applications which use the Graphics Language, which is often referred to as PGL.

  This feature can co-exist with the IBM Intelligent Printer Data Stream feature, and/or with either coax/twinax feature or can be used on the ASCII models.

- Network Print Server:

  Enables you to attach your printer to Local Area Networks using token-ring or Ethernet protocols. The Network Print Server functions as a workstation server on your network, enabling your users to submit print jobs to your printer.

  The Network Print Server provides multiple network protocol support that allows you to submit print jobs from Novell** Netware**, IBM LAN Server, IBM AIX*, and other TCP/IP networks.

- Dataproducts Adapter:

  Supplies a 50 pin AMP Amplimite HDH-20 data cable connector. This feature is necessary if you are using the Dataproducts parallel protocol.

- Ethernet Interface:

  Enables you to attach your printer to Local Area Networks using Ethernet protocols. The Ethernet Interface functions as a workstation server on your network, enabling your users to submit print jobs to your printer.

- Power Paper Stacker:

  Mechanically directs the paper from the printer to the paper stacking area. This feature provides consistent paper handling with fewer paper jam errors.

- Input Paper Shelf:

  Pedestal model only. Provides a shelf to hold a box of paper or forms. This is a convenient feature if you need to move the printer often.

- TN5250/TN3270 Emulations:

  The TN5250/TN3270 feature enables your printer to communicate with an IBM host through a Network Interface Card (NIC) using the 5250/3270 datastream. This feature allows you to use an application generated for the Twinax/Coax emulation to be printed through the NIC.

  Users who are converting from Twinax to TN5250 may see some differences. Please refer to the "Compatibility and Limitations" on page 306 for details.

- ANSI Emulation:

  The ANSI option allows you to print files coded for the ANSI (American National Standards Institute) printer control language.

Protocols And Emulations

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

Most impact printers are single ASCII character codes to print text, numbers, and punctuation marks. Some characters, both singularly and in groups are defined as control codes. Control codes instruct the printer to perform specific functions, such as underlining text, print subscripts, setting page margins, etc. The main difference between most printer protocols is in the characters used to create control codes and the ways in which these characters are formatted.

When the printer executes the character and control codes of a particular printer protocol, it is "emulating" that printer. If the printer uses the Proprinter III XL protocol, for example, it is emulating an IBM® Proprinter III XL printer. If the printer is using the Epson FX printer protocol, for example, we can also say it is in Epson FX emulation mode.

There are additional emulations that are provided as optional features, such the Code V and IGP emulations. For additional information, refer to "Code V Feature (VGL)" on page 209 and "IGP Feature (PGL)" on page 203.

Graphics Enhancements

The PGL and Code V emulations allow you to create and store forms, generate logos, bar codes, expanded characters, and create other graphics. Alphanumeric and bar code data are added as the form is printed.

These emulations are available as factory-installed or field-installed options. For more information, contact your authorized service representative.

Taking Care Of Your Printer

Your printer will produce high print quality jobs if it is well taken care of. Periodic cleaning, handling the printer properly, and using the correct printer supplies such as paper and ribbons ensures optimum performance. Chapter 6 explains how to clean the printer, and printer supplies are listed in Appendix A.

Whenever it is necessary to service the printer, remember these important maintenance concepts:

- Use only the ribbons specified in Appendix A. Use of incorrect ribbons can lead to ink migration problems, degraded print quality, and expensive damage to the printer.

- Incorrect closure of the forms thickness lever can lead to smearing, degraded print quality, paper jams, and damage to the platen and shuttle assembly. Never close the forms thickness lever too tightly.

2 *Installation*

Installation, Attachment, And Configuration Overview

Note!

Before using this information and the product it supports, read the information in "Notices" on page 329.

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 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 on page 85.

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 IBM 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.

   a. For ASCII attachments, follow the instructions in the *6400 ASCII Programmer's Reference Manual.*

   b. For Coax/Twinax attachments, follow the instructions in the *6400 Coax/Twinax Programmer's Reference Manual.*

   c. If you have ordered the Network Print Server feature, follow the instructions in either the *Network Print Server Ethernet Administrator's Guide,* or the *Network Print Server Token-Ring Administrator's Guide.*

   d. If you have ordered the Ethernet Interface, follow the instructions in the *Ethernet Interface User's Manual.*

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 297.

7. Configure the printer to work with host systems and to match your emulation, such as IBM Proprinter III XL. Follow the instructions provided in Chapter 3, "Configuring the Printer" and review the information provided in Appendix C, "Host Attachment."

NOTE: If you are replacing an printer 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. For a brief description of the following optional features, refer to: "IPDS Feature" on page 187, "Code V Feature (VGL)" on page 209, and "IGP Feature (PGL)" on page 203.

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 "Related Documents" on page 15.

Before You Begin

Read this chapter carefully before installing and operating the printer. The printer is easy to install. However, 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 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

<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) or 139 kilograms (306 pounds) if the Power Paper Stacker is installed. The shipping weight of the pedestal model printer is 72.6 kilograms (160 pounds.)**

Power Requirements

The printer must be connected to a power outlet that supplies 88 to 135 Volts AC or 178 to 271 Volts AC at 50 to 60 Hz. The printer automatically senses and adjusts itself to conform to the correct voltage range.

Primary circuit protection is provided by the power switch, which is also a circuit breaker. Consult an electrician if printer operation affects local electrical lines. See "Electrical Characteristics" on page 294 for additional power specifications.

IMPORTANT

Printer power should be supplied from a separate AC circuit protected at 10 amperes for 100 - 120 volts or 5 amperes for 200 - 240 volts at 50 or 60 Hertz.

Select A Site

Select a printer site that meets all of the following requirements:

- **Cabinet models:** Permits complete opening of the printer cover and both doors of the floor cabinet. Allows at least three feet of clearance behind the printer. (This permits air to circulate freely around the printer and provides access to the paper stacking area.)

- **Pedestal models:** Permits complete opening of the printer cover and good access to the paper areas at the front and rear of the printer.

- Has a standard power outlet that supplies 88-135 Volts AC or 178-270 Volts AC power, at 47 to 63 Hz. The printer automatically senses and adjusts itself to conform to the correct voltage range.

- Is relatively dust-free.

- Has a temperature range of 10° C to 40° C (50° F to 104° F) and a relative humidity from 15% to 90% non-condensing.

- Is located within the maximum allowable cable length to the host computer. This distance depends on the type of interface you plan to use, as shown in Table 2.

Table 2. Maximum Interface Connection Cable Length

Interface Type	Maximum Cable Length
PC Parallel	5 meters (15 feet)
IEEE 1284 Parallel	10 meters (32 feet)
Dataproducts Parallel	12 meters (40 feet)
Serial RS 232	15 meters (50 feet)
Serial RS 422	1220 meters (4000 feet)
Twinax (shielded cable)	1500 meters (4920 feet)
Twisted Pair / Type 3	300 meters (985 feet)
Dataproducts Long Line	150 meters (492 feet)
Coax	1500 meters (4920 feet)
Twisted Pair / Type 3	300 meters (985 feet)
Ethernet 10/100Base-T	100 meters (328 feet)
Ethernet 10Base-2	185 meters (607 feet)

Printer Dimensions

27.0 in
(68.84 cm)

29.0 in
(73.7 cm)

83.0 in
(210.8 cm)

27.0 in
(68.6 cm)

41.0 in
(104 cm)

57.5 in
(146.1 cm)

27.0 in
(68.6 cm)

6csite2
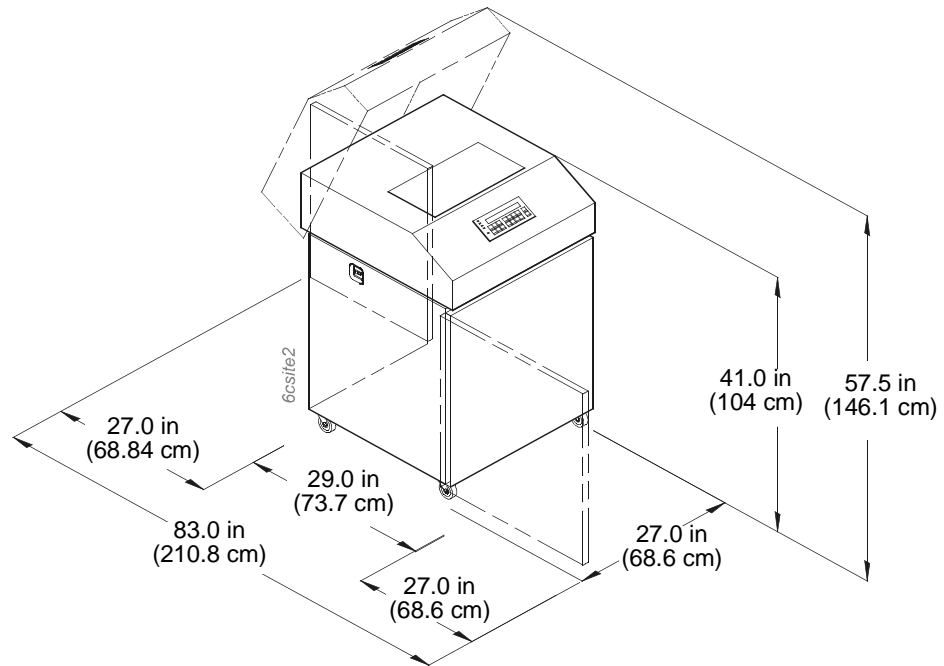
Figure 1. Exploded View Of Cabinet Model Printer Dimensions

27.0 in
(68.6 cm)

32.5 in
(82.6 cm)

83.0 in
(210.8 cm)

27.0 in
(68.6 cm)

42.5 in
(107.8 cm)

59.0 in
(149.9 cm)

27.0 in
(68.6 cm)

32.0 in
(81.3 cm)

6csite
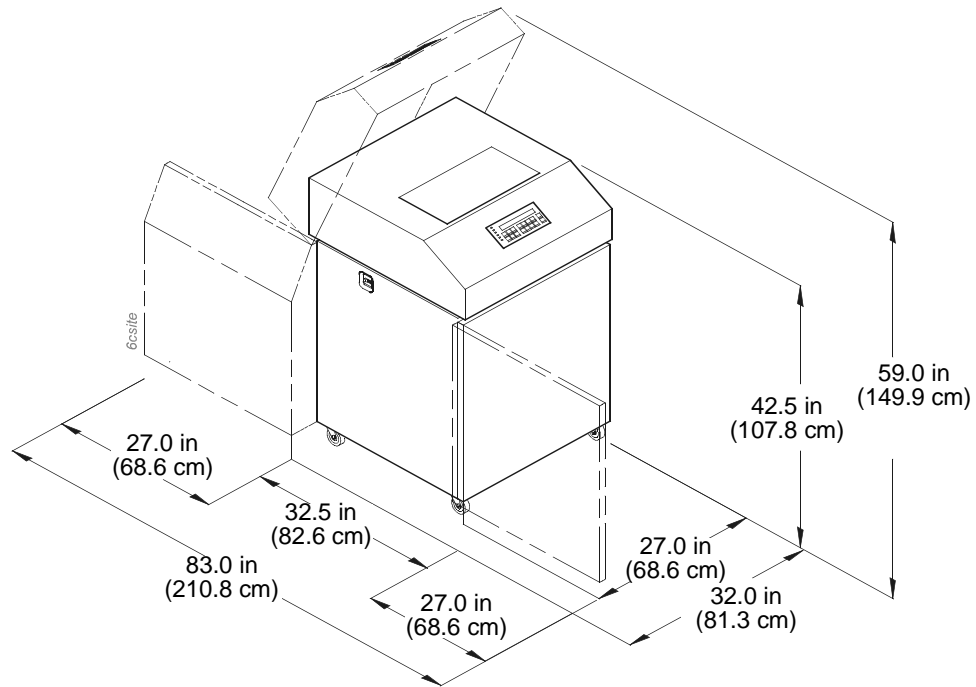
Figure 2. Exploded View Of Cabinet Model With Power Paper Stacker Printer Dimensions

29

25 in.
(63.5 cm)

10.5 in.
(26.67 cm.)

48.0 in.
(122 cm)

p6usite

24.6 in.
(62.48 cm)

30 in.
(76.2 cm.)
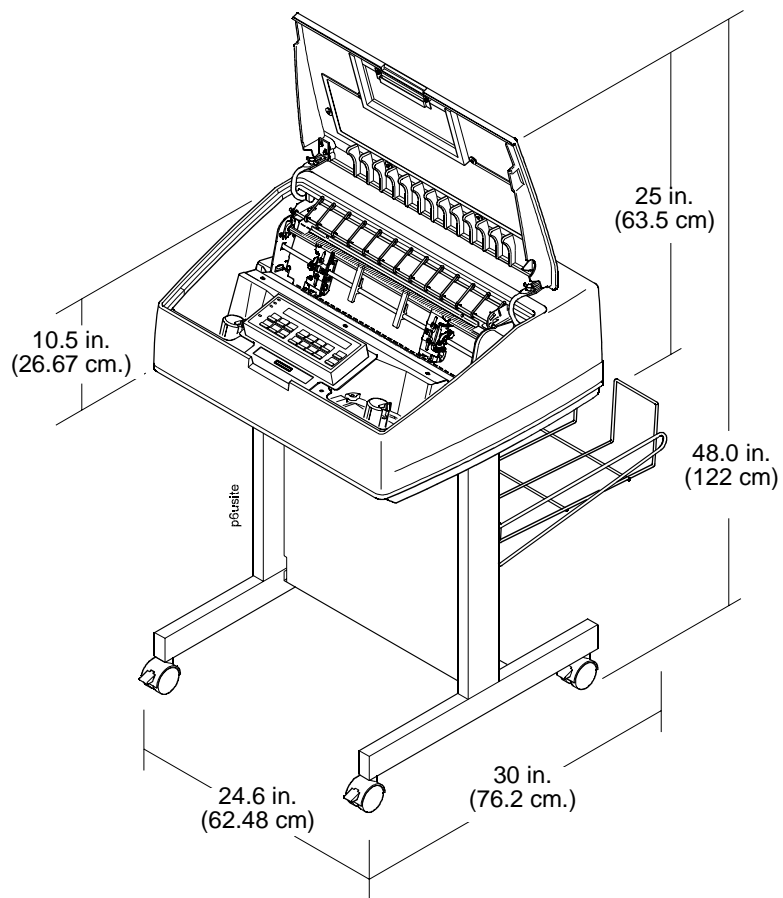
Figure 3. Exploded View Of Pedestal Model Printer Dimensions

Printer Component Locations

Familiarize yourself with the names and locations of the printer components, shown in Figure 4, and Figure 5 before continuing with the rest of the installation procedures.
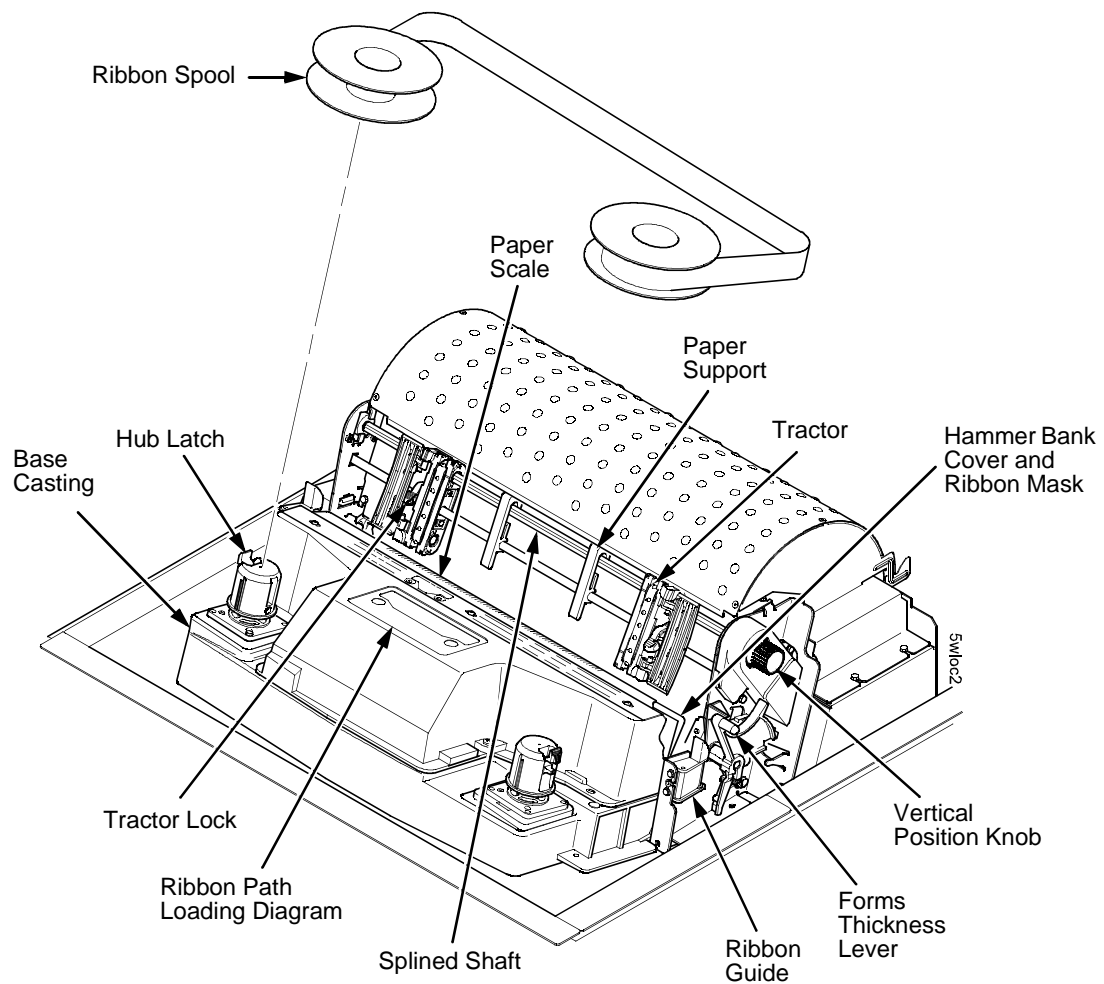
Figure 4. 6400 Series Models Printer Component Locations with Ribbon Spools Exploded Above

Ribbon Spool

Tractor Lock

Printer Cover

Tractor Door

Tractor

Adjustable Paper Guide

Shuttle Cover Assembly

Adjustable Hinge

Hammerbank Cover & Ribbon Mask

p6wloc1

Operator Panel

Splined Shaft

Forms Thickness Lever

Ribbon Hub

Ribbon Guide

Hub Latch
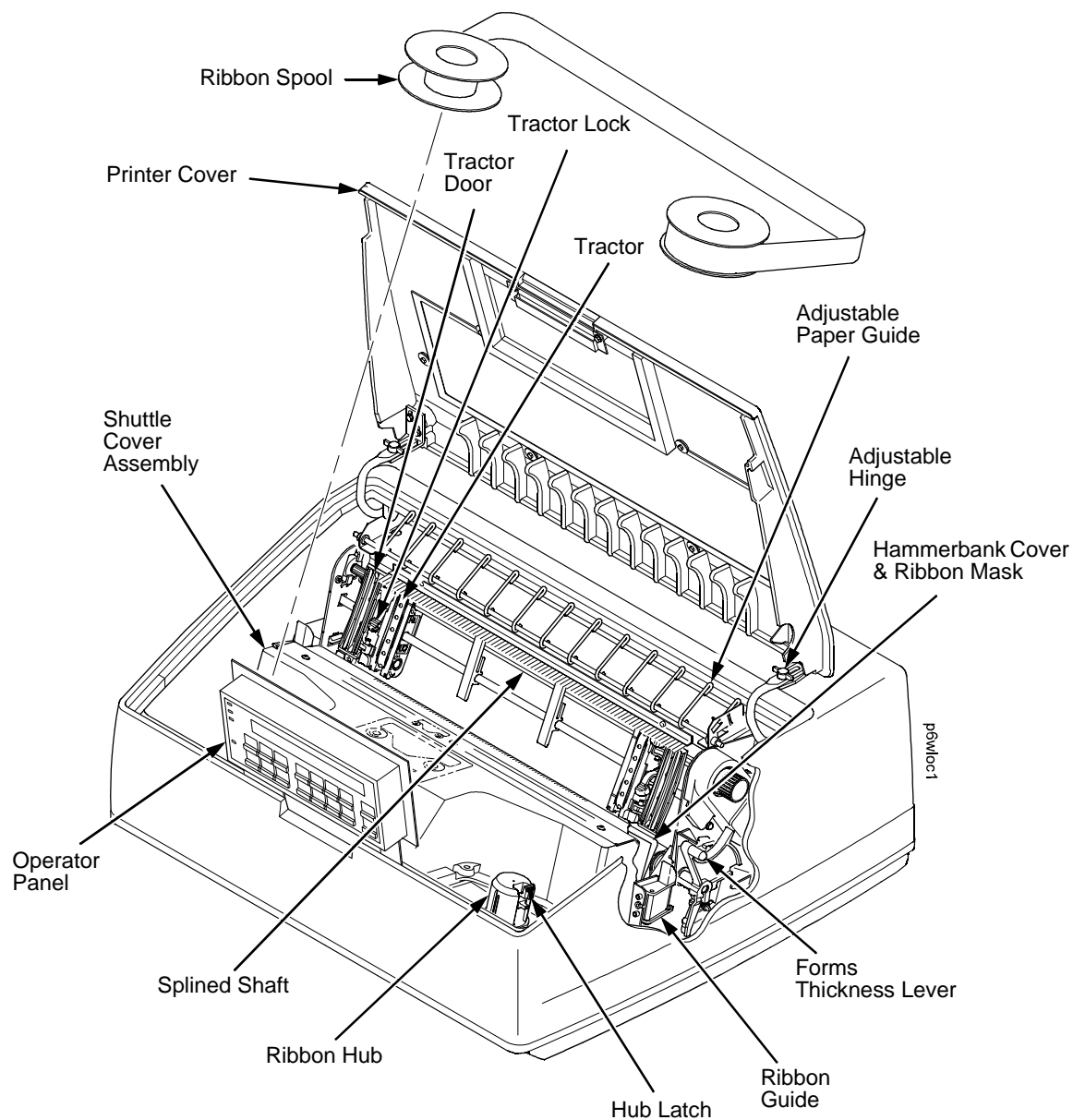
Figure 5. Pedestal Model Printer Component Locations with Open Access Cover and Ribbon Spools Exploded Above

Remove Shipping Restraints (Cabinet Model)

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
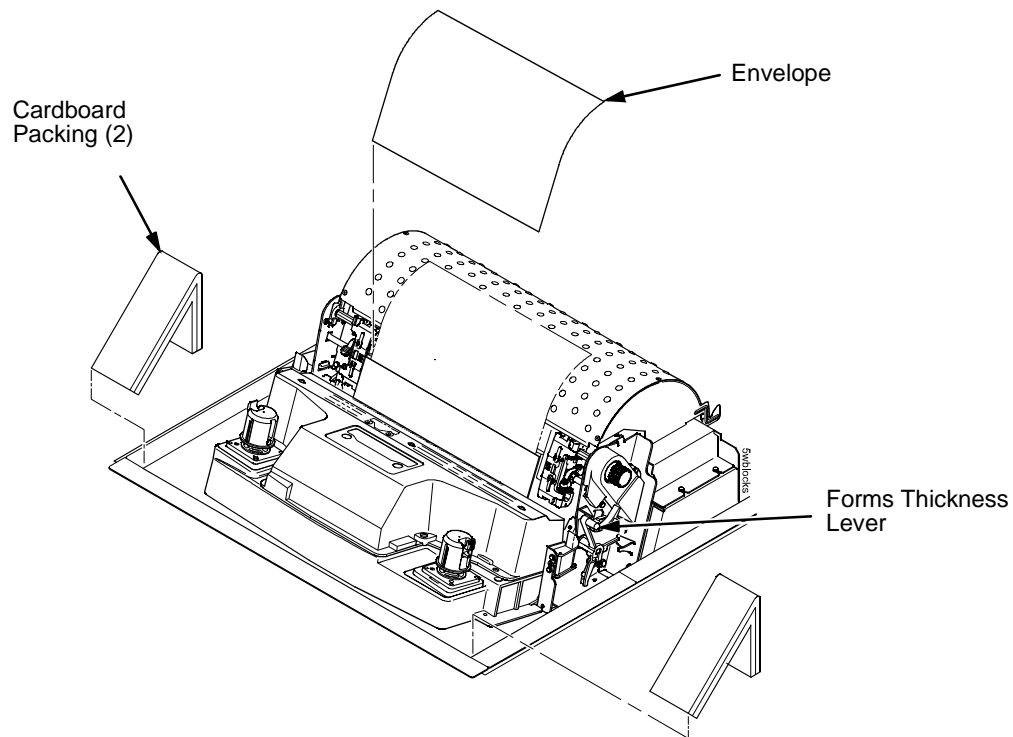
Figure 6. Removing the Cardboard Packing and Sample Configuration Printout

1. Raise the printer cover.

2. Remove the cardboard packing.

3. Open the tractor doors.

4. Push the tractor locks down.

5. Slide the tractors outward as far as they will go. The forms thickness lever should be in the fully open (raised) position.

6. Remove the envelope that contains the sample configuration printout.

7. Store this in the pouch that is attached to the left interior side of the cabinet.

Remove The Hammer Bank Protective Foam

Hammer Bank
Protective Foam

Paper Supports (2)

Forms Thickness
Lever
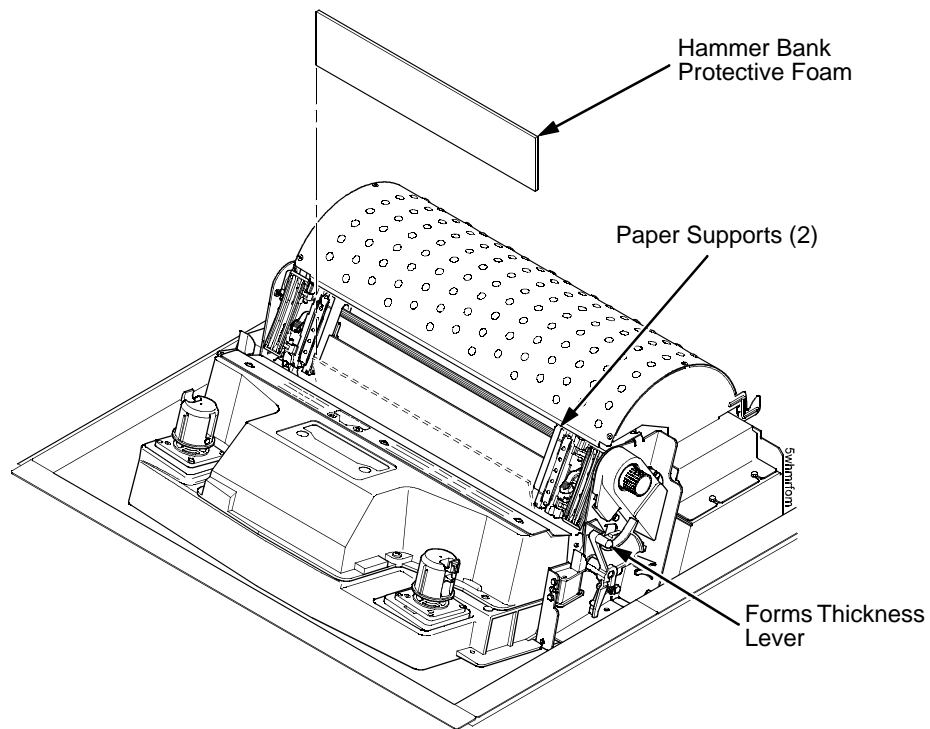
Figure 7. Exploded View of the Removal of the Hammer Bank Protective Foam, 6400 Series Models

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.

3. Rotate the forms thickness lever downward to position "A."

Hammer Bank
Protective Foam

62wbloks
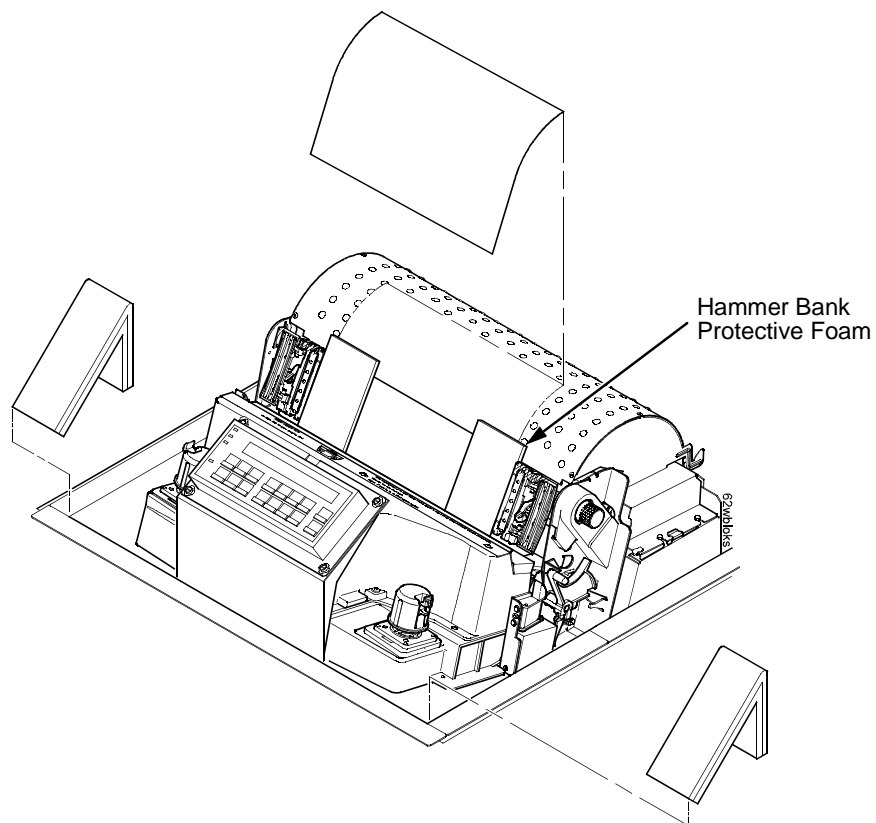
Figure 8. Exploded View of Removal of the Hammer Bank Protective Foam, -i20, -i2s, and -i24 Models

-i20, -i2s, -i24 Models:

4.   Cut the tie wrap and remove it from the side plate.

5.   Lift the hammer bank protective foam and remove it from between the ribbon mask and the platen.

Remove The Platen Protective Foam
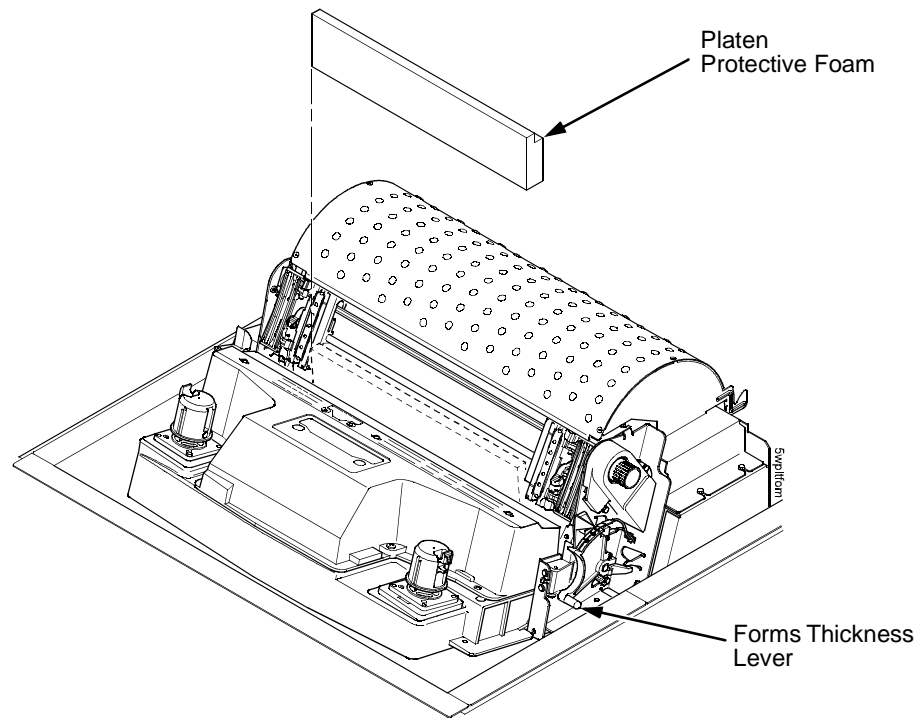
Figure 9. Exploded View of Removal of the Platen Protective Foam, 6400 Series Models

1. Rotate the forms thickness lever downward to position "A."

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

3. Remove the platen protective foam.

    NOTE: The 6400-i20, -i2s, and -i24 models do not have a platen protective foam.

Remove Wood Blocks

Wood Blocks (6)

6vwwdblk
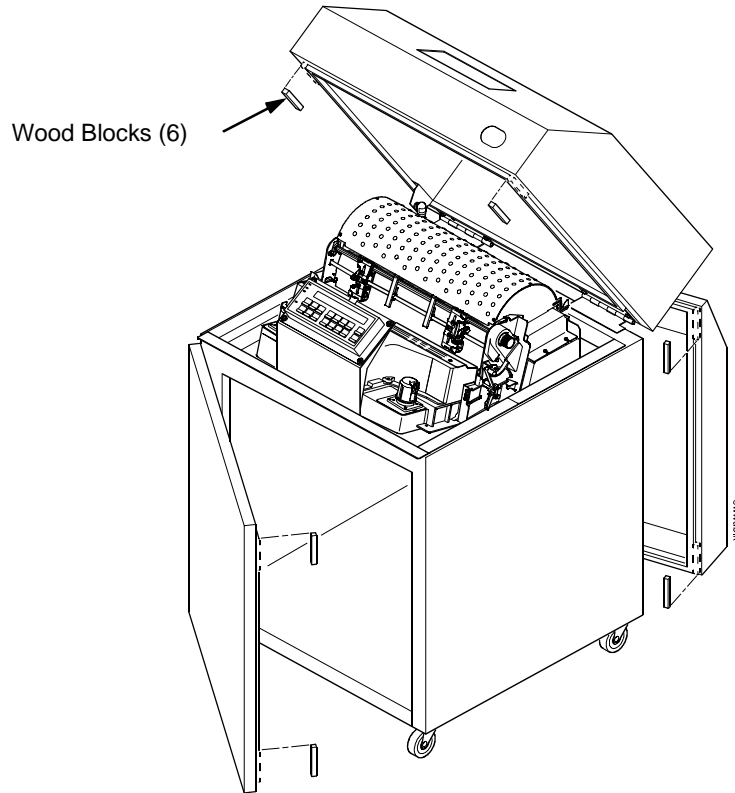
Figure 10. Cover, Front, and Back Door Cabinet Open, Showing the Removal of Six Wood Blocks

1. Remove the six wood blocks.

    NOTE: Make sure the tape securing the wood blocks is removed entirely.

Adjust The Paper Supports

Paper Supports (2)
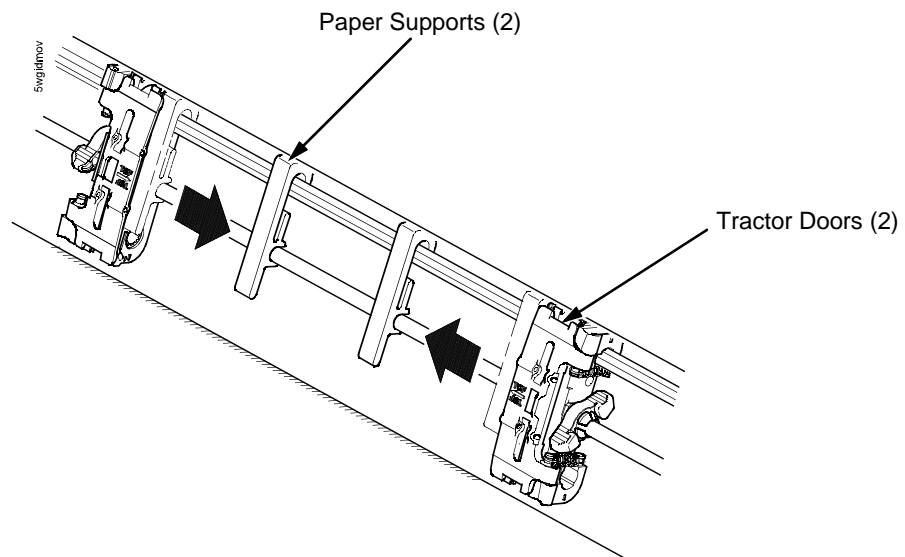
Tractor Doors (2)

Figure 11. Paper Supports With Directional Arrows Showing the Adjustment Capabilities, 6400 Series Models

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

Release The Paper Chains (Cabinet Model)

Tie Wraps (2)

Paper Chains (8)

Bags (2)
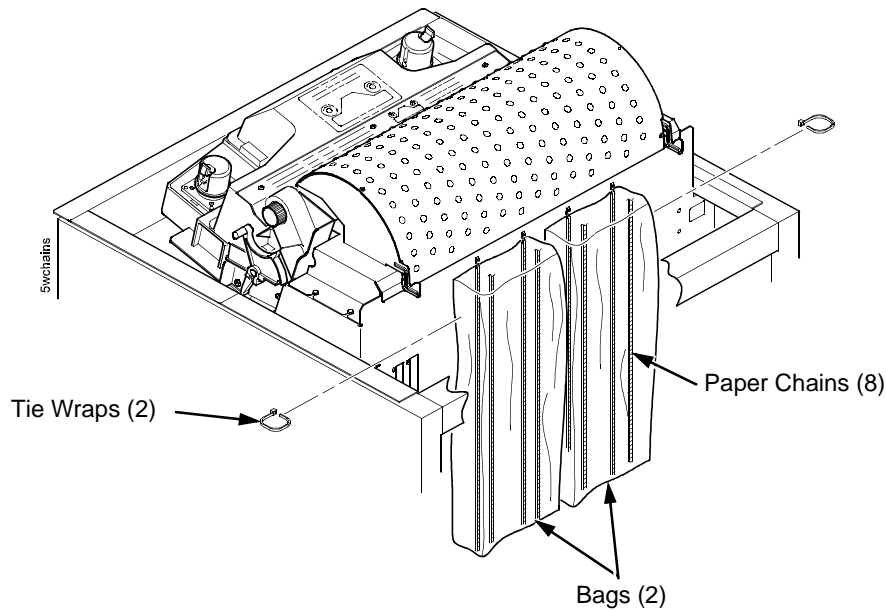
Figure 12. Back View of Printer Components, Cover Off, Showing the Release of Paper Chains

> **NOTE:** If you have the power paper stacker installed, skip this procedure and go to "Remove The Shipping Restraints From The Power Paper Stacker" on page 42.

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.

3. Make sure each chain hangs freely with no kinks or knots.

Remove Tags (Cabinet Model)
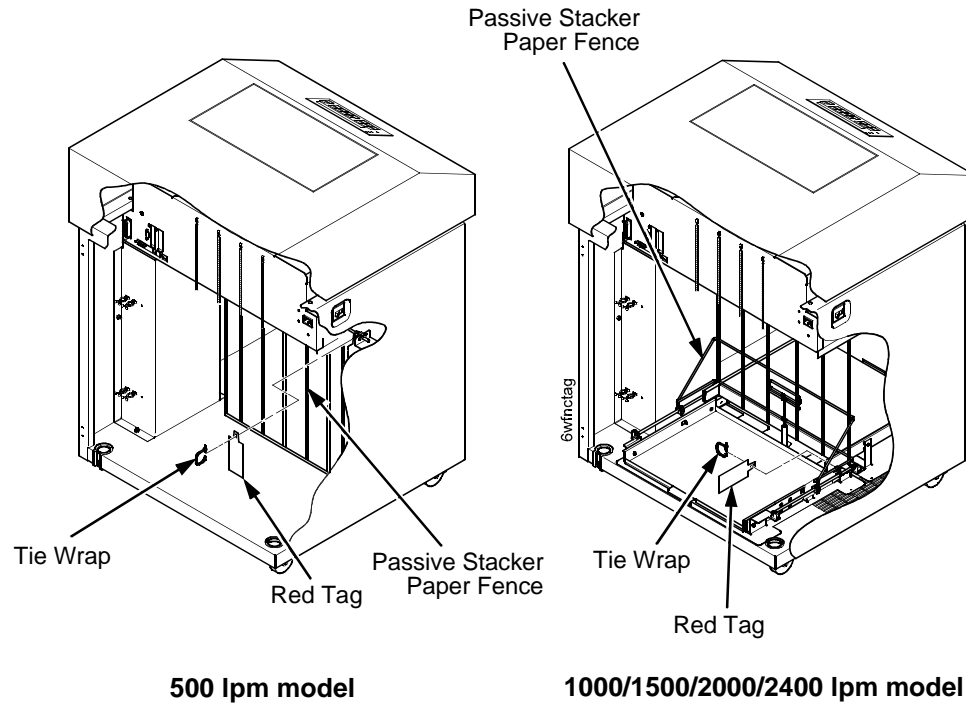
Figure 13. Interior View Showing Removal Tag Removal from the Cabinet Models

> **NOTE:** If you have the power paper stacker installed, skip this procedure and go to "Remove The Shipping Restraints From The Power Paper Stacker" on page 42.

1. Remove the tie wrap attached to the passive stacker paper fence. The tie wrap is marked with a large, red tag.

2. Close the cabinet rear door.

Remove The Shipping Restraints From The Power Paper Stacker

This section applies only to printers with the power stacker installed. The power stacker can be factory or field installed.

The power stacker is a vertically movable paper guide which directs the paper from the printer to the paper stack. This movement enhances the paper stacking capabilities of the printer.

Special packaging protects the power stacker mechanisms from damage during shipment. This section describes how to remove the shipping restraints before you operate the printer.

Save the packaging materials. You will need to reinstall them if you decide to move or ship the printer. To reinstall the packaging materials, reverse the steps in this section.

IMPORTANT

To avoid shipping damage, install the shipping restraints whenever you move or ship the printer.

Paper Guide

Tie Wraps (8)

5sntiwrp
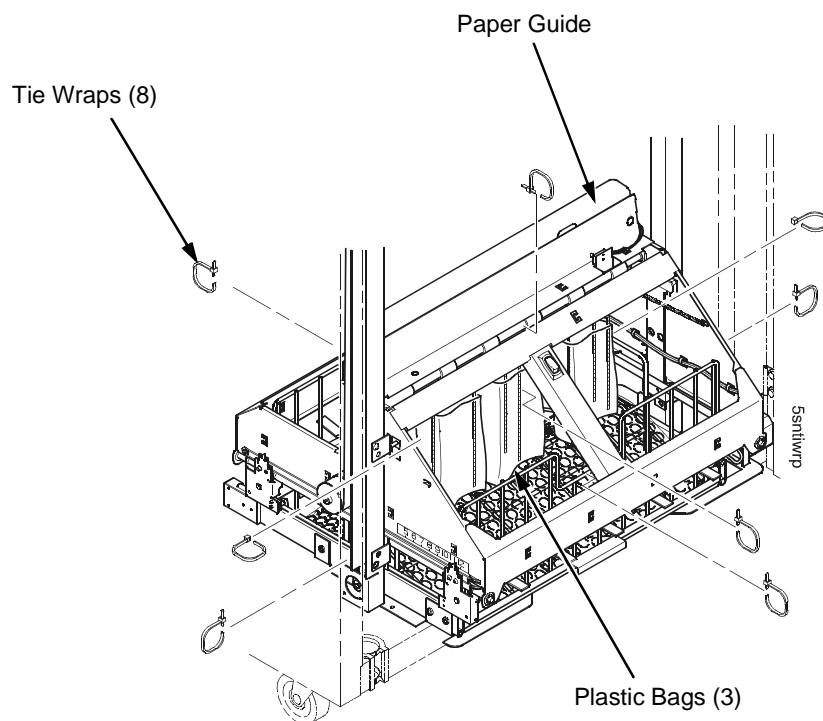
Plastic Bags (3)

Figure 14. View of the Power Paper Stacker Showing Removal of the Shipping Restraints such as Tie Wraps and Plastic Bags

1. Open the rear door panel.

2. Remove the eight tie wraps.

3. Raise the paper guide to its highest position by hand.

4. Remove the plastic bags from the paper chains.

5. Verify that both fences are in the down position.
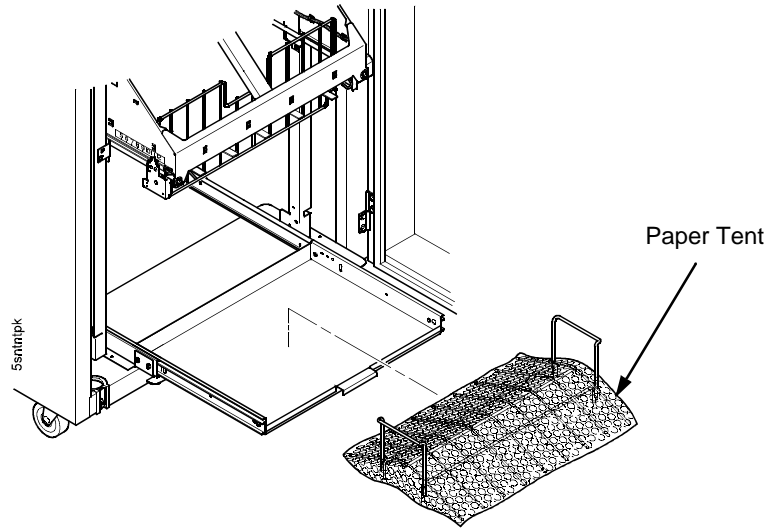
Paper Tent

Figure 15. View of the Pull-Out Drawer Illustrating Placement of the Paper Tent

6. Remove, unwrap, and replace the paper tent onto the pull-out drawer.

Removing Shipping Restraints (Pedestal Model)

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
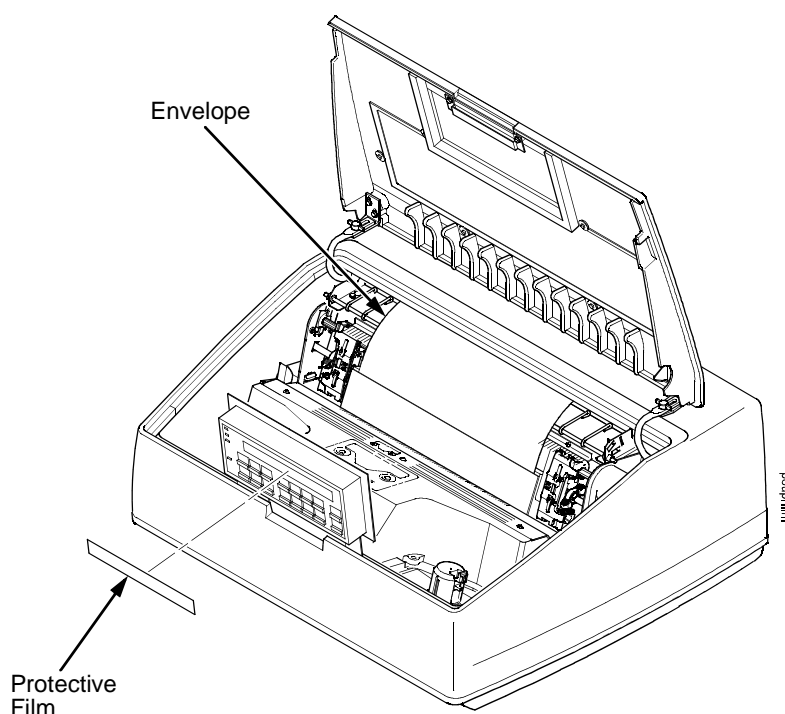
Figure 16. Pedestal Model with Cover Open Showing Removal of the Operator Panel Message Display Protective Film and Sample Configuration Printout Envelope

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.

4. Push the tractor locks down.

5. Slide the tractors outward as far as they will go. The forms thickness lever should be raised (in the fully open position).

6. 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 And Protective Foam
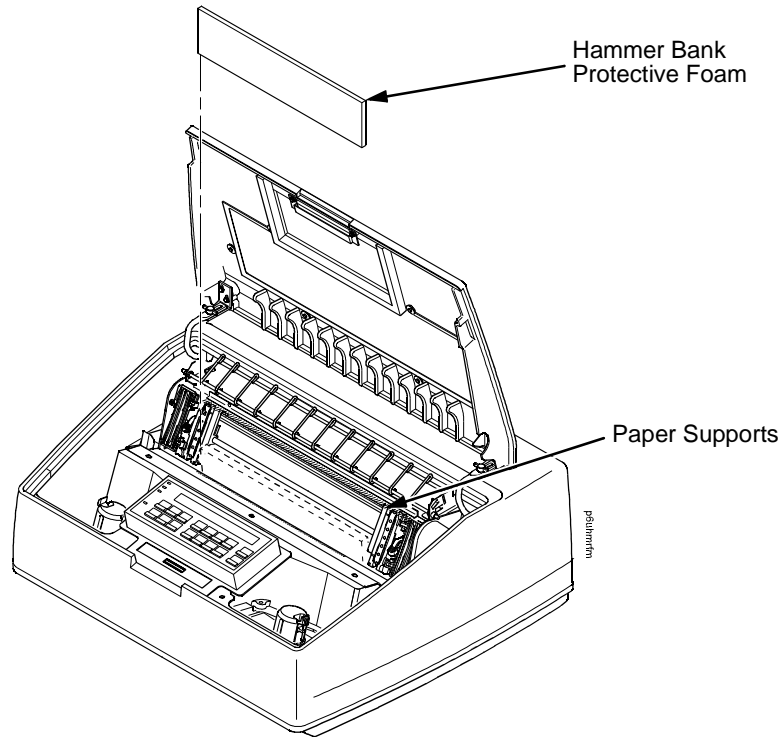
Figure 17. Pedestal Model with Cover Open Showing Removal of the Hammer Bank Protective Foam

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

Platen
Protective Foam

Support Shaft

Forms
Thickness Lever
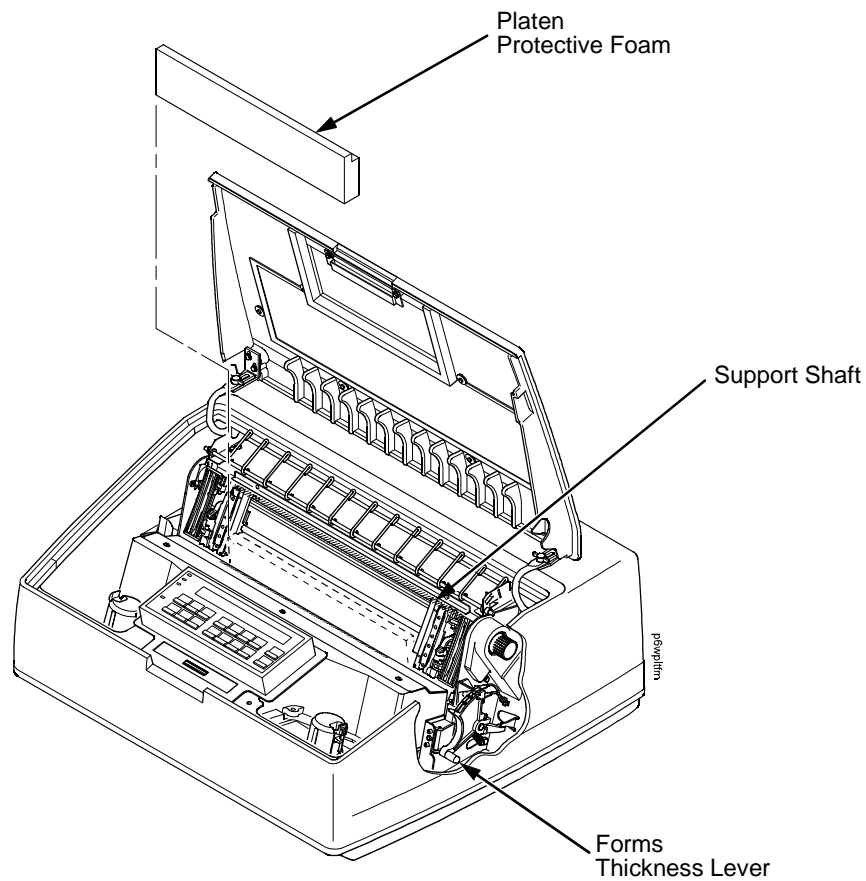
**Figure 18. Pedestal Model with Cover Open Showing Removal of the Platen Protective
Foam**

1. Rotate the forms thickness lever downward (to position "A").

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

3. Remove the platen protective foam.

Attach The Input Paper Shelf and Output Basket
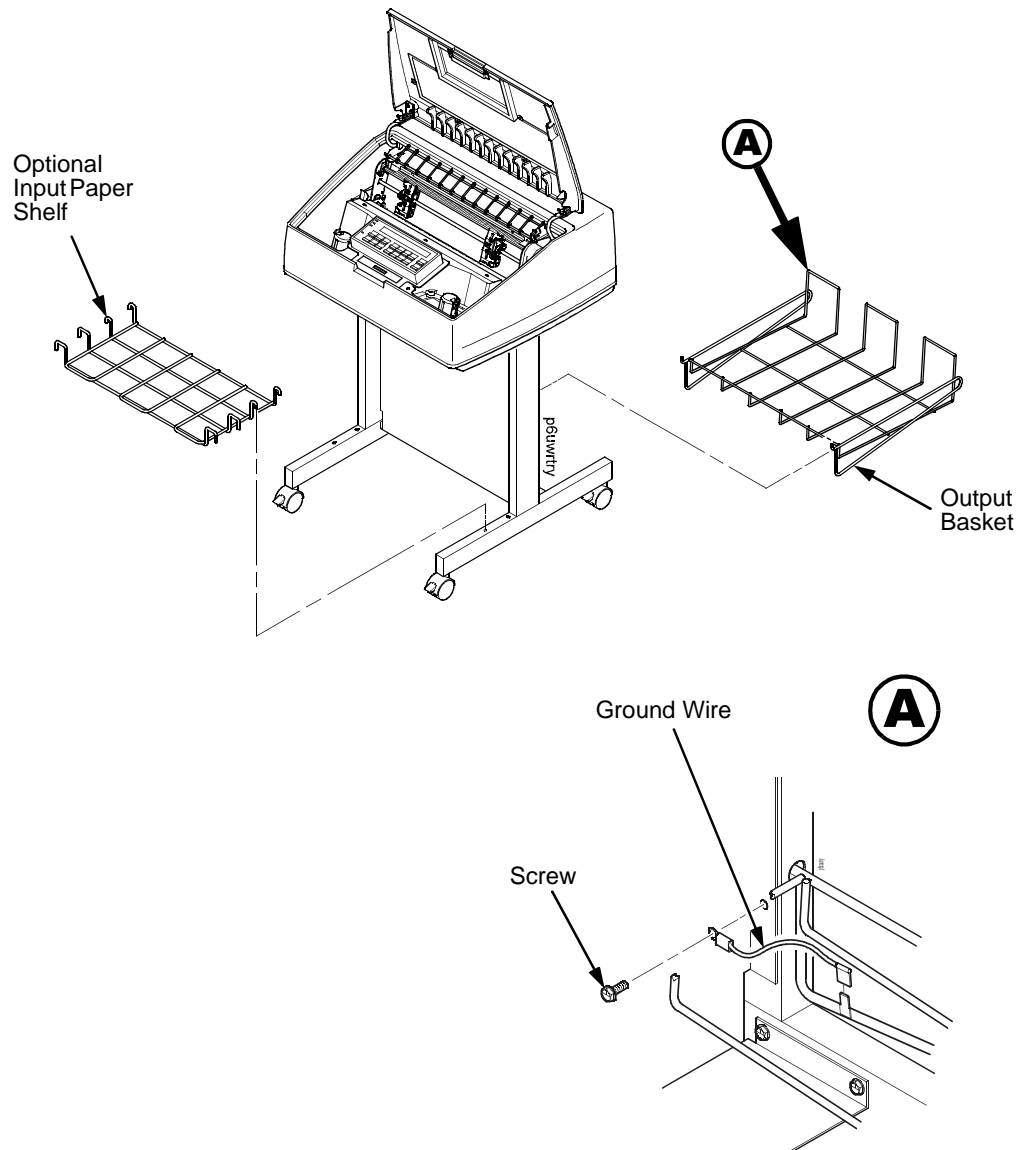
Figure 19. Exploded View of the Pedestal Model Showing Output Basket Attachment

1. Slide the two paper supports toward the center of the support shaft. Position them so that they divide teh space between the tractors into three approximately equal segments.

2. Place the output basket in the holes in the back of the printer.

3. Screw the ground wire attached to the output basket to the printer.

4. Place the input paper shelf (optional feaure) in the holes in the front of the pedestal base.

47

Remove Tags - Pedestal Model
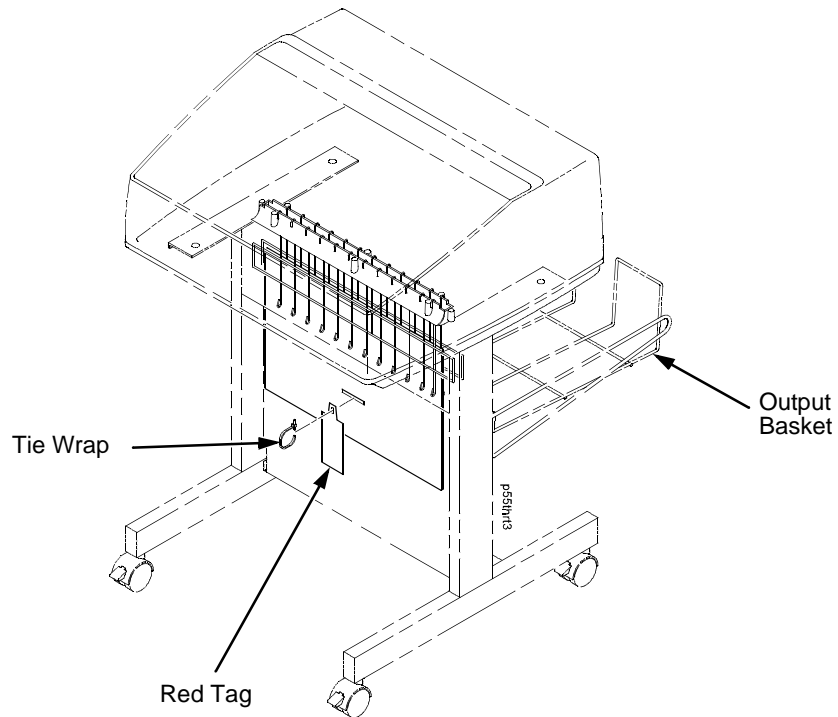
Figure 20. View of the Pedestal Model Showing Removal of the Tie Wrap

Remove the tie wrap attached to the output basket. It is marked with a large, red tag.

Changing the Paper Exit Location (Pedestal Models Only)

On pedestal model printers you can select whether the paper exits from the rear or from the top of the printer. Normally, you should select the top exit only when you will be tearing the forms from the printer and using them soon after printing. Forms will not stack in top exit mode.

Setting Top Paper Exit

1. Press **Stop** to place the printer in NOT READY state.

If there is paper in the printer, unload the paper, then continue with step 2 of this procedure.
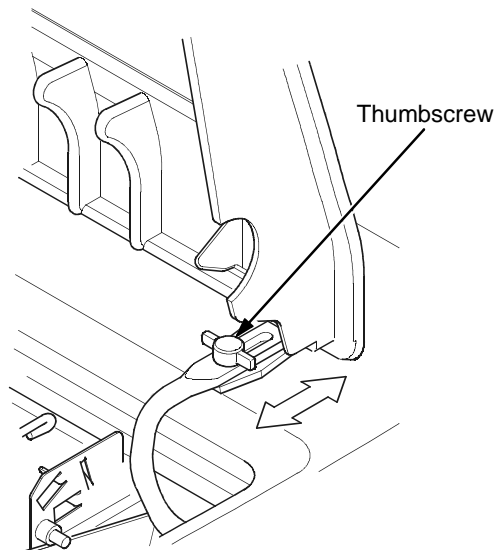
Thumbscrew

Figure 21. Underview of the Right, Rear Pedestal Cover Showing Adjustment of the Hinge Thumbscrews

2. Open the printer cover.

3. Loosen the two hinge adjustment thumbscrews.

4. Slide the cover toward the rear of the printer until it stops.
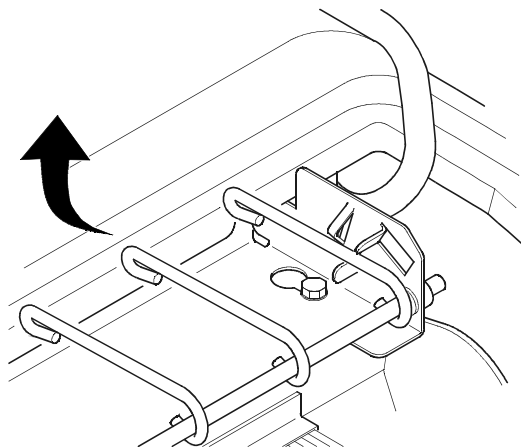
Figure 22. Inside View of the Pedestal Model Showing Paper Exit Options

5. Tighten the two hinge adjustment thumbscrews.

6. Slide the paper guide slightly to the left and raise it to its upper position for the top exit.
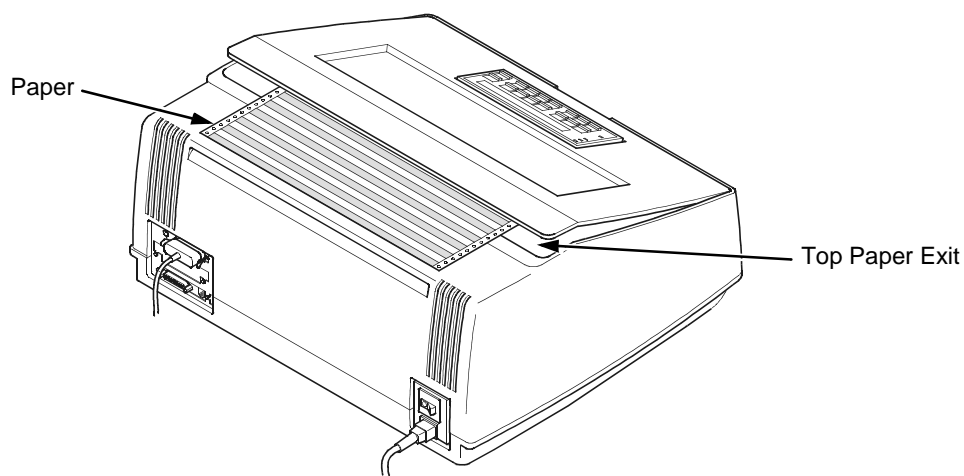
Figure 23. Top Back View of the Pedestal Model with Paper Exiting through the Top Paper Exit

7. Load the paper (see page 66), feeding it out the top paper exit.

Setting Rear Paper Exit

1. Press **Stop** to place the printer in NOT READY state.

NOTE: If there is paper in the printer, unload the paper, then continue with step 2 of this procedure.
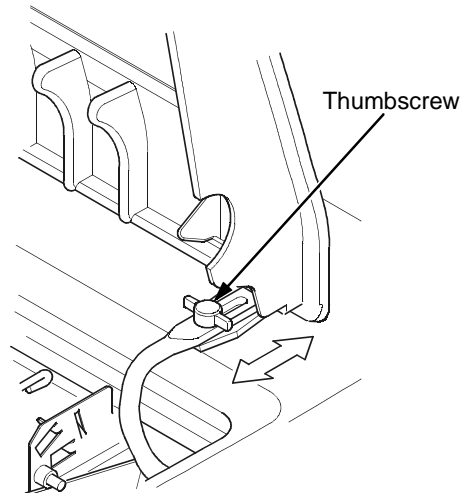
Figure 24. Loosening the Hinge Thumbscres, Open View of the Back Rear Pedestal Model Cover

2. Open the printer cover.

3. Loosen the two hinge adjustment thumbscrews.

4. Slide the cover forward until it stops.
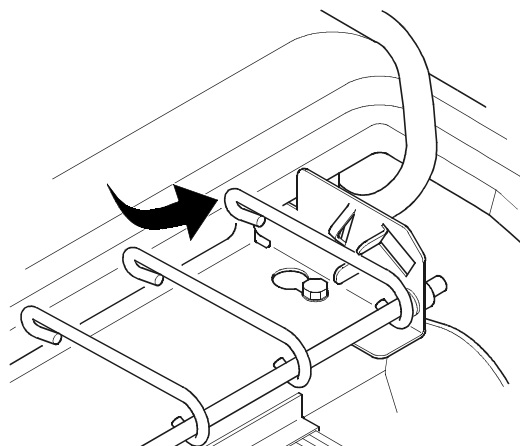
Figure 25. Internal View of the Pedestal Model Showing Paper Exit Options

5. Tighten the two hinge adjustment thumbscrews.

6. Place the paper guide in its lower position.
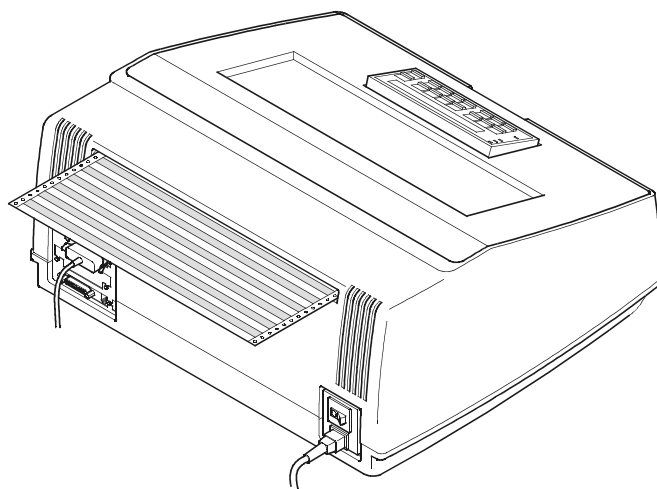
Figure 26. Top Back View of the Pedestal Model with Paper Exiting through the Rear

7. Load the paper (see page 66), feeding the paper out of the rear paper exit.

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 page 27 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 communication port, teleport, or attachment cable connector.**

1. Verify that the voltage source at the printer site conforms to the requirements specified on page 28. Make sure that the printer power switch is set to OFF. See Figure 29 on page 54.

2. Open the front cabinet door, remove and open the cardboard box containing the power cord, printer ribbon, and operator panel overlay label. Refer to "Printer Specifications" on page 289 for recommended cables. Documentation is stored in a pouch container on the left interior side of the cabinet.

3. Connect the customer supplied interface cable from the host computer to the appropriate printer interface connector (refer to Figure 27 through Figure 32).

4. Thread the power cable connector up through the notch in the lower-right back corner of the cabinet (see Figure 31). Plug the power cord into the printer AC power connector, then into the AC power outlet.
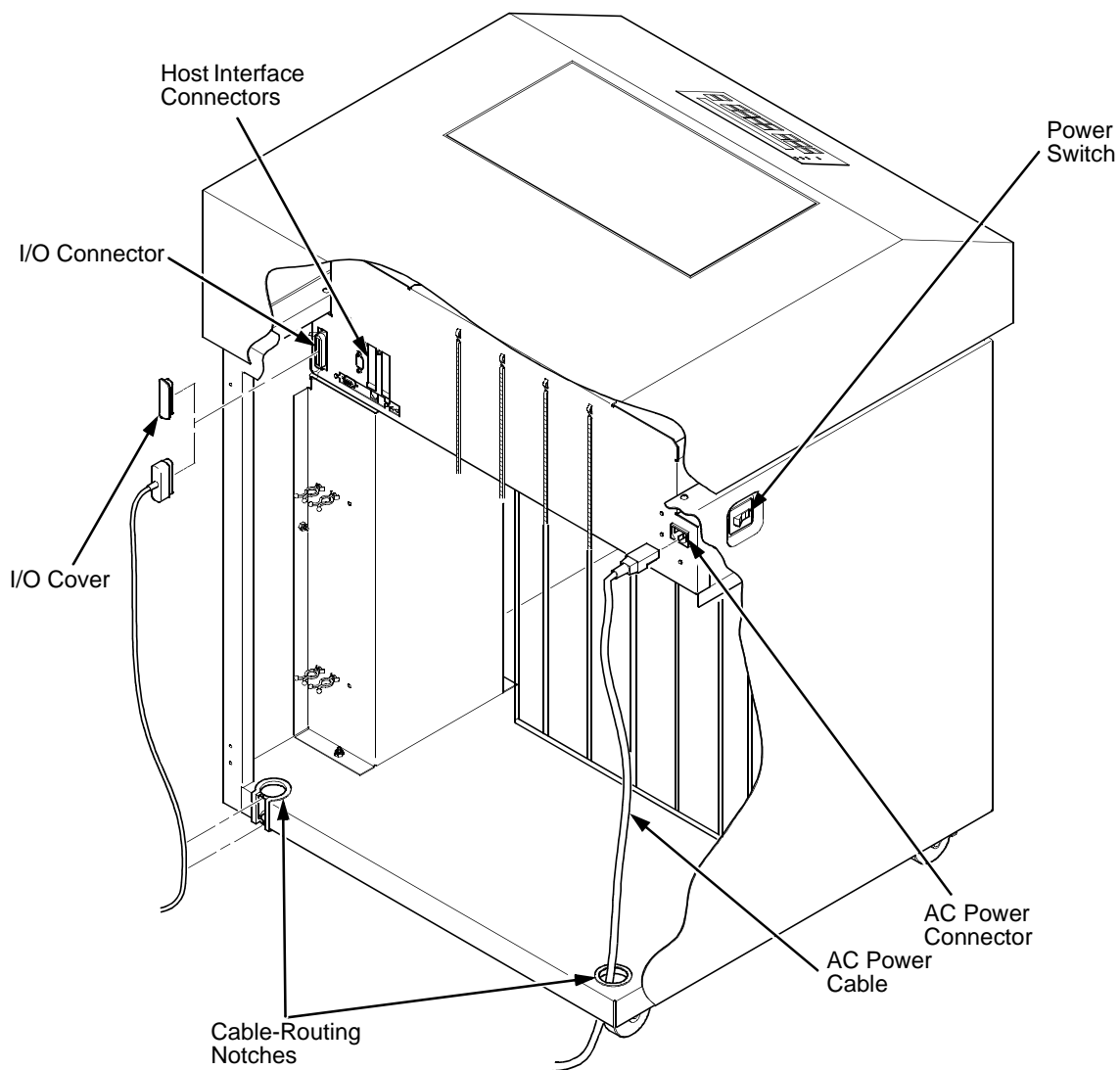
NOTE:

[1] The Dataproducts adapter feature attaches to the PC Parallel interface connector.

[2] Twinax, Coax, and Ethernet Interfaces appear only if these features are installed.

Figure 27. Internal Back View of the Cabinet Model Showing Interface and Power Cable Connections
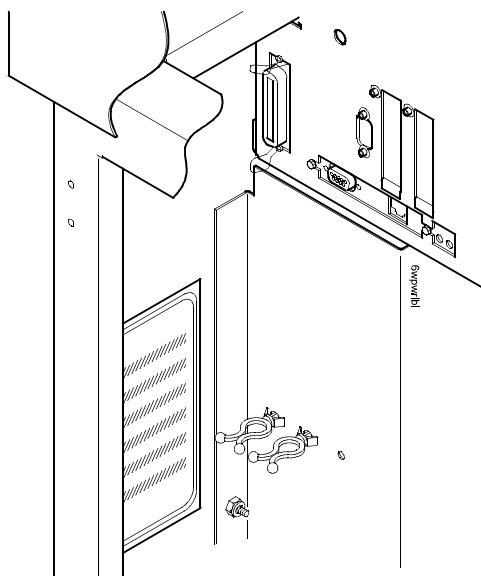
Figure 28. Interior Back View of the Cabinet Model Showing Product Description Label Location

1. Check the product description label to verify that the voltage source at the printer site conforms to the requirements specified on page 28.
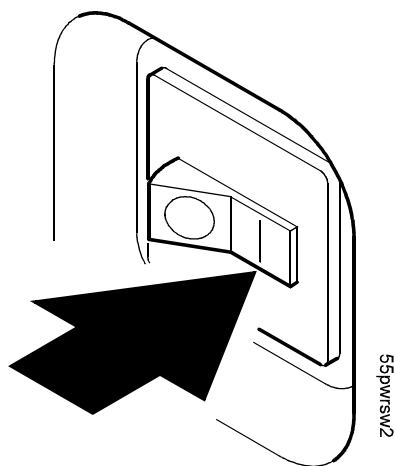
Figure 29. Power Switch Turned OFF

2. Make sure the printer switch is set to OFF.
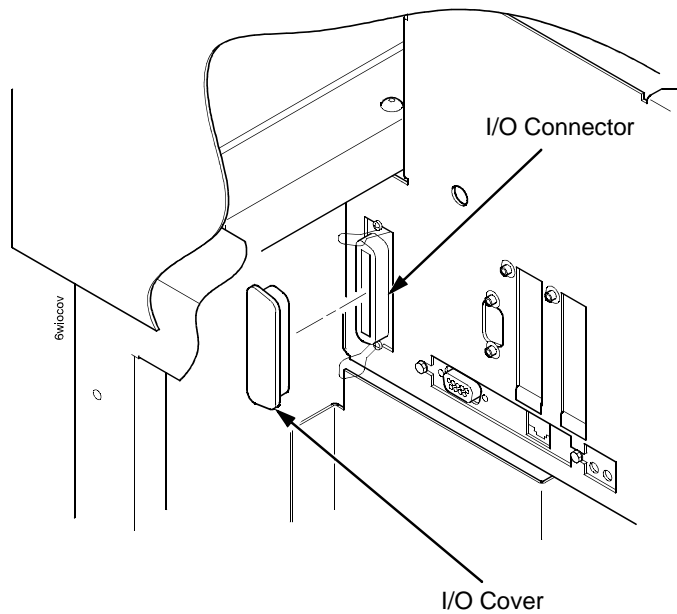
Figure 30. Upper-Rear Inside View of the Cabinet Model Showing I/O Cover Removal

    3.   Open the cabinet rear door.

    4.   Remove the cover from the I/O connector you have selected.
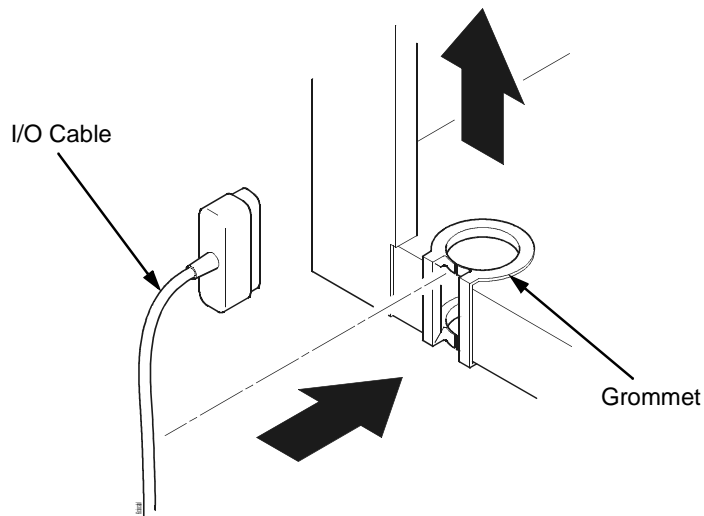
Figure 31. Bottom-Rear Inside View of the Cabinet Model Showing the Cable Routing Notch

    5.   Locate the notch in the lower-left corner of the back of the cabinet.

    6.   Hold the I/O cable below its connector, and gently push the cable through the opening in the grommet seated in the notch.

55

I/O Connector

I/O Plate
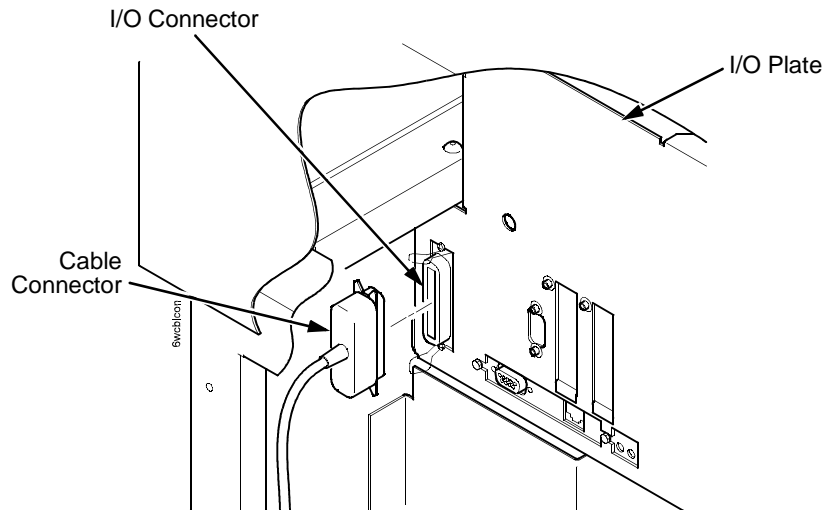
Cable
Connector

Figure 32. Upper Inside View of the Cabinet Model Showing Cable Connector Attachment

7. Pull the cable up through the notch until it reaches the I/O plate.

8. Attach the cable connector to the printer I/O connector.

9. Secure the cable to the printer using the two cable standoffs.
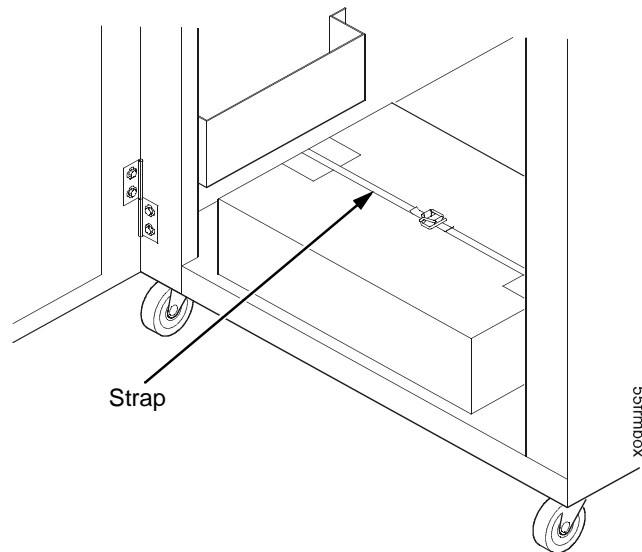
Strap

Figure 33. Open Cabinet Front Door Showing the Printer Accessories Package

10. Open the cabinet front door and cut the strap that secures the box, which contains the power cord, printer ribbon, control panel overlay labels, and documentation.

11. Open the box and remove the power cord, overlays, and documentation.
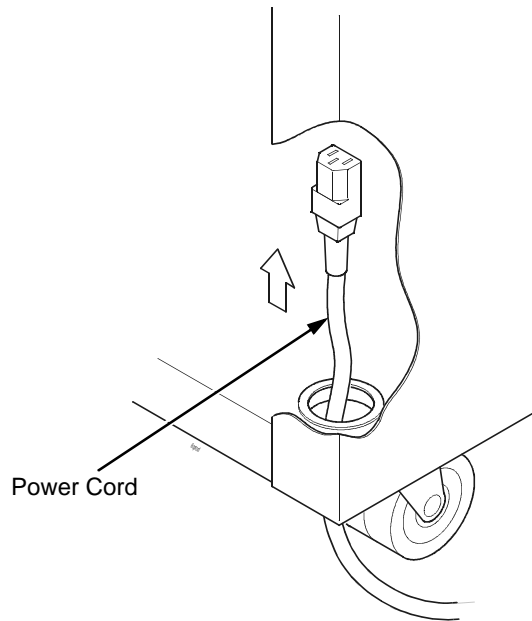
Figure 34. Rear Inside View of the Cabinet Model Showing the Power Cord Route

12. Guide the power cord up through the hole in the lower right back corner of the cabinet.

13. Thread the power cord inside the bracket where the gas spring is attached.
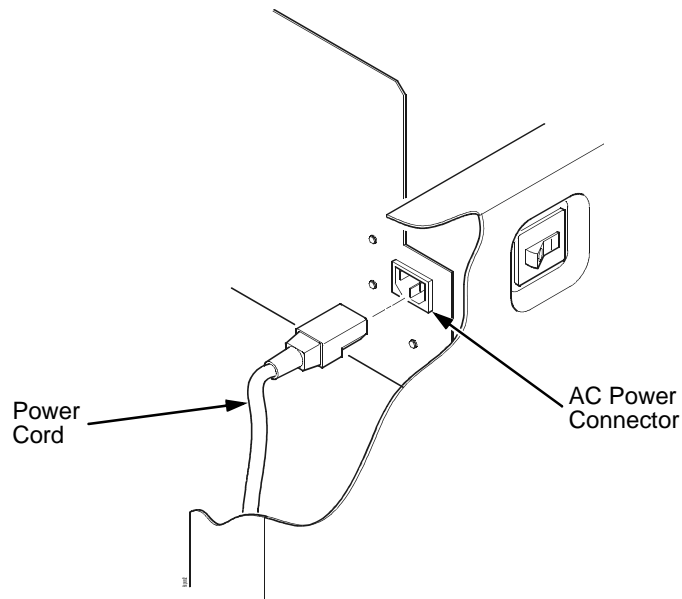
Figure 35. Rear Inside View Cabinet Model Showing Power Cord Attachment

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

57

Connect The Interface And Power Cables (Pedestal Models)

 DANGER

<1>	**Before powering on the printer, ensure the printer is plugged into an appropriate power source. Refer to page 27 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 communication port, teleport, or attachment cable connector.**

1. Verify that the voltage source at the printer site conforms to the requirements specified on page 28.

2. Open the box containing the power cord, printer ribbon, and operator panel overlay label. Refer to "Cables" on page 297 for recommended cables.

Parallel Connector

Auxiliary I/O

A

Serial Connector

AC Power Connector

NOTE:
[1] The Dataproducts adapter feature attaches to the PC Parallel interface connector.
[2] Twinax, Coax, and Ethernet Interfaces appear only if these features are installed.

Power Switch
On   Off

A
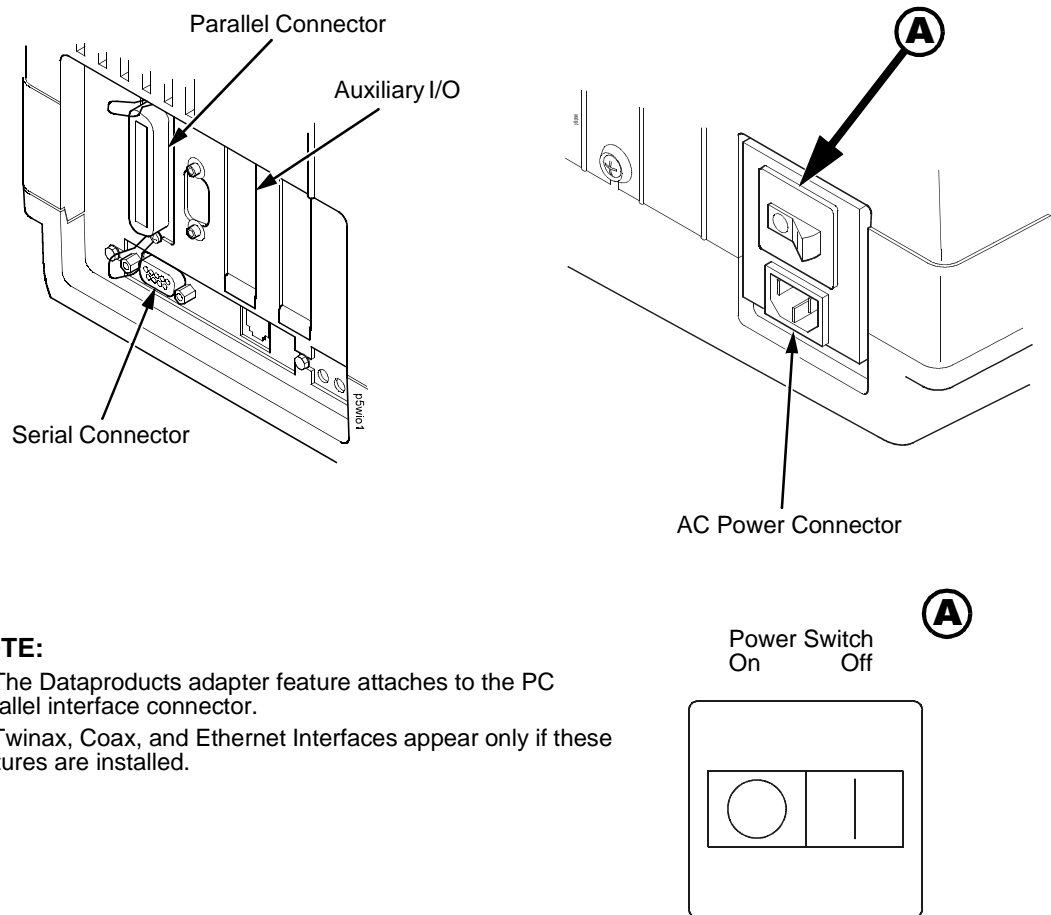
Figure 36. Views of Interface and the AC Power Connector

3. Make sure that the printer power switch is set to OFF. See Figure 29 on page 54.
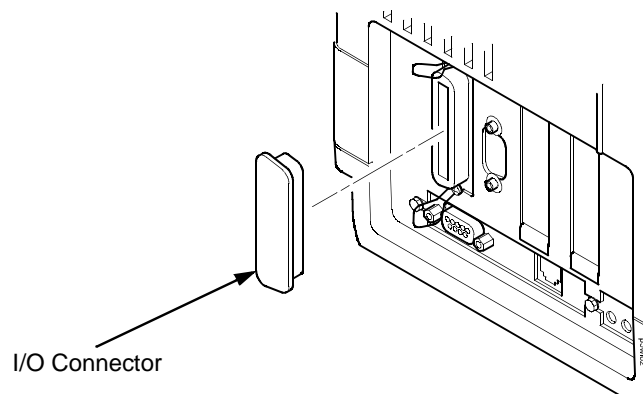
I/O Connector

Figure 37. I/O Cover Removal from the Interface

4. Remove the cover from the I/O connector you have selected.
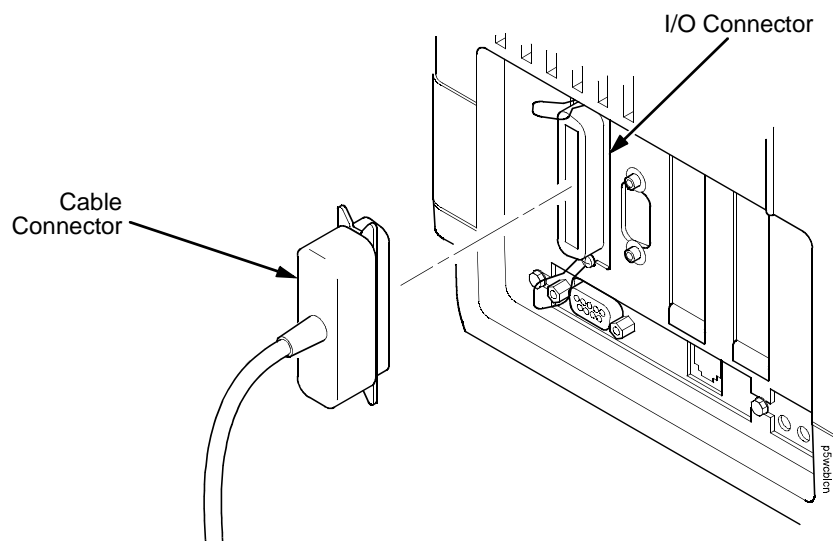
Figure 38. View of the Printer Interface Showing Cable Connector Attachment

5. Attach the cable connector to the printer I/O connector.
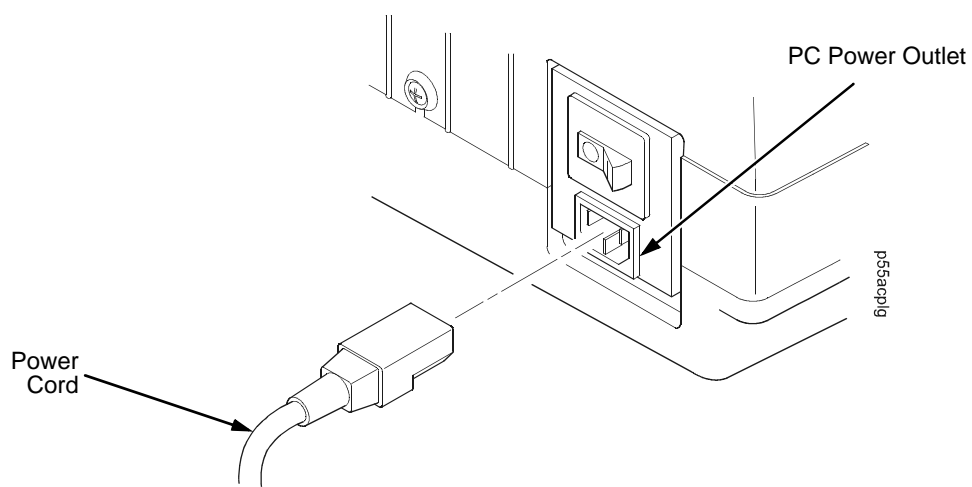
Figure 39. View of the Power Cord Attachment

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

Dataproducts I/O Adapter

Centronics, Ethernet

Auxiliary I/O

Dataproducts
Standard Adapter

Diagnostic

Serial RS-232/RS-422

Pedestal Models

Ethernet

Auxiliary I/O

Centronics

Serial RS-23

Diagnostic
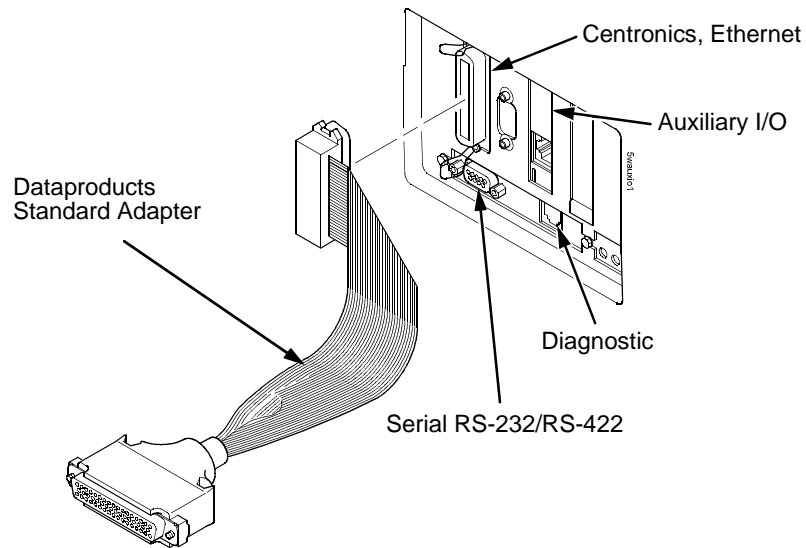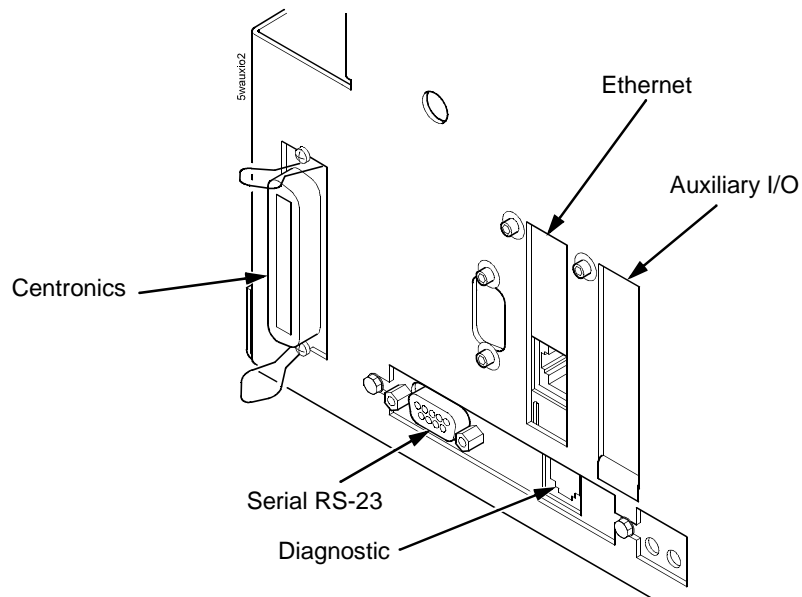
Cabinet Models

Figure 40. Pedestal and Cabinet Model Dataproducts I/O Adapter

NOTE: Centronics is not present on Network-based models.
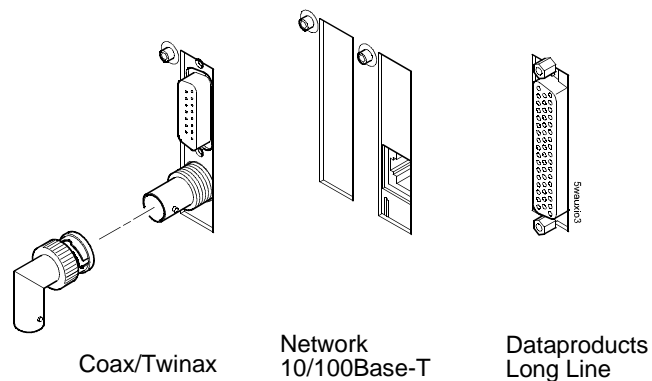
Figure 41. Optional Interface Types for Auxiliary I/O

Attach The Operator Panel Overlay Label
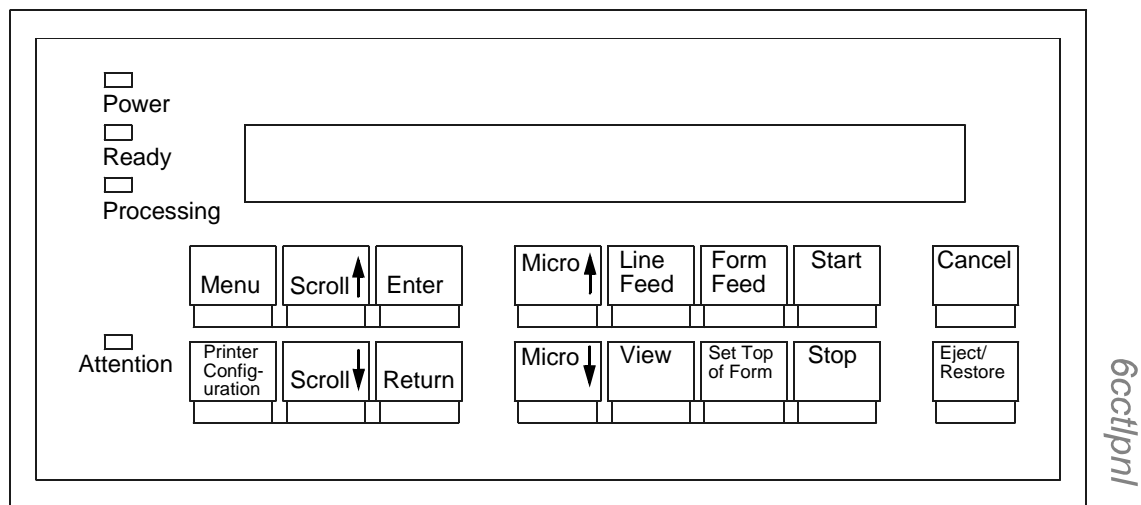
Figure 42. The Operator Panel Overlay Label

1. Choose the overlay labels in the appropriate language.

2. Attach the operator panel overlay label by adhering it to your operator panel.

Install The Ribbon

Refer to the ribbon path diagram molded onto the shuttle cover for the following steps.
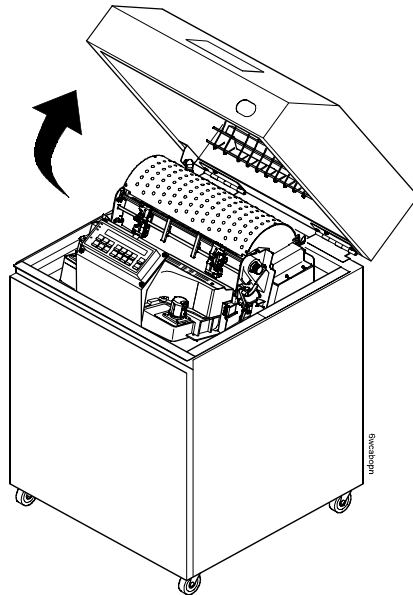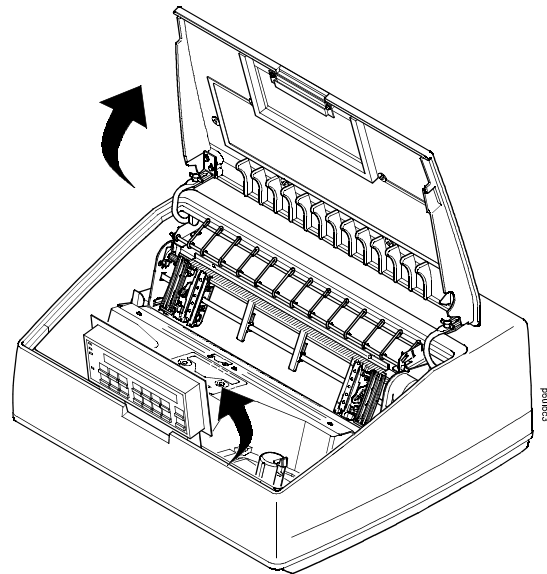
Cabinet Model   **Pedestal Model**

Figure 43. Cabinet and Pedestal Models with the Printer Cover Open

1.   Open the printer cover.

2.   **Pedestal models:** pull the operator panel up and out of the way. The operator panel can be pulled toward you to provide clearance.
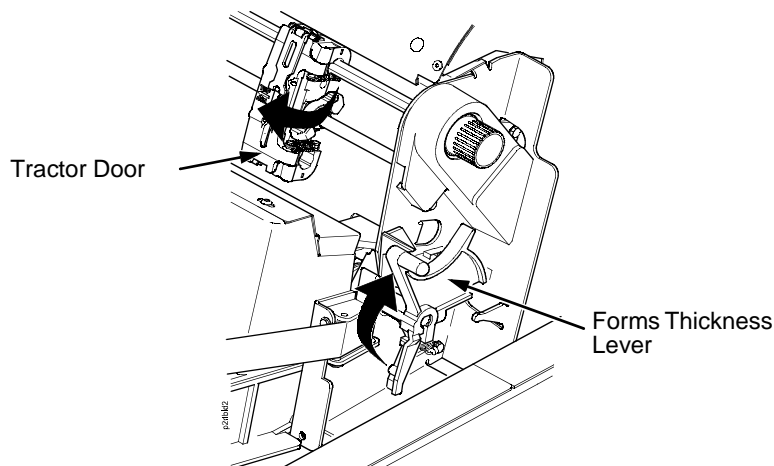
Figure 44. View of the Forms Thickness Lever in the Raised Position

3. Raise the forms thickness lever as far as it will go.

4. Press **STOP** to silence the alarm.

5. Close the tractor doors.

6. Remove the ribbon spools from the package.
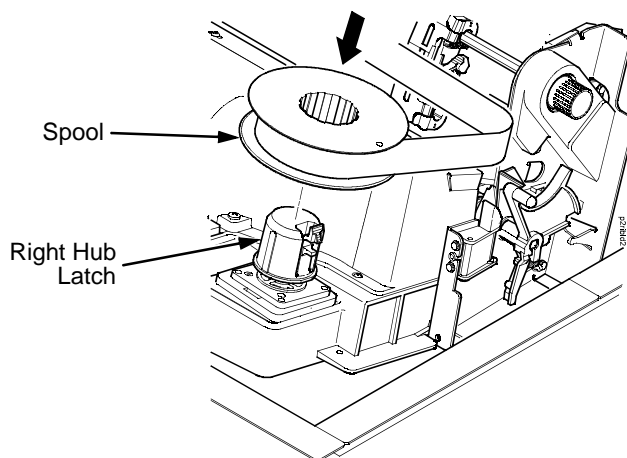
Figure 45. View of the Right Ribbon Hub with Ribbon Spool Above

7. With the ribbon supply to the outside, squeeze the right hub latch and place the full spool on the right ribbon hub.

8. Press the spool down until the hub latch snaps into place.

NOTE: The ribbon must not be twisted. A twisted ribbon can lower print quality, shorten ribbon life, and cause paper or ribbon jams.

If you are installing a "Clean Hands" ribbon (identified by a long metalic leader), the leader will enable you to install the ribbon without getting ink on your hands.

Cabinet Models

Left Ribbon Spool

Forms Thickness
Lever

Left Ribbon
Spool

Pedestal Models

Forms Thickness
Lever
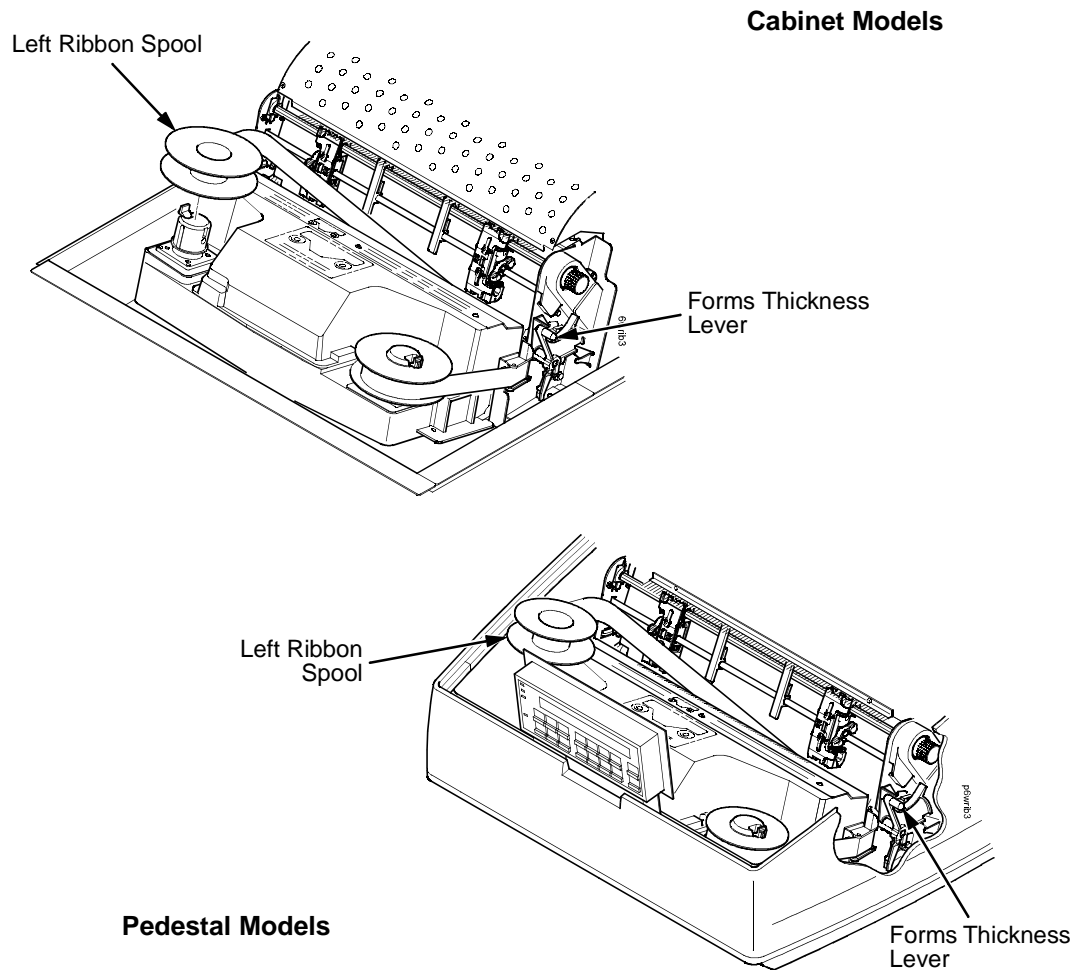
Figure 46. Cabinet and Pedestal Models, Interior View of Ribbon Installation

9. 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.

10. Place the empty spool on the left hub.

11. Press the spool down until the hub latch snaps into place.

12. Turn the left spool by hand and check to ensure that the ribbon tracks correctly in the ribbon path and around the ribbon guides.

NOTE: Printers with the "Clean Hands" ribbon automatically load the ribbon when the first print job is sent.

13. Close the forms thickness lever.

Load The Paper
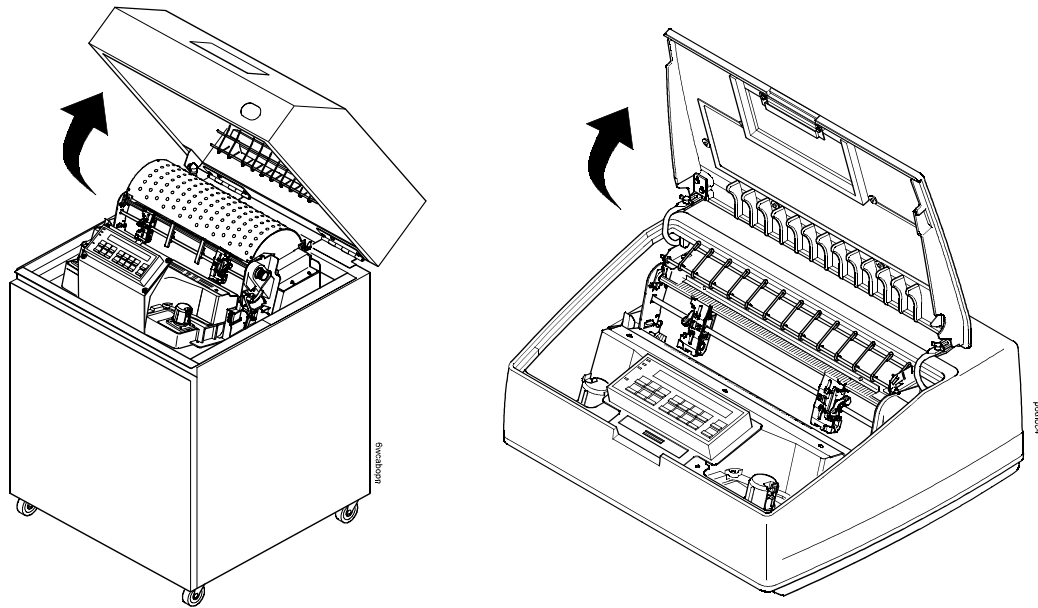
Figure 47. Cabinet and Pedestal Models with Printer Cover Open

    1.   Open the printer cover.

Tractor Door

Forms Thickness Lever
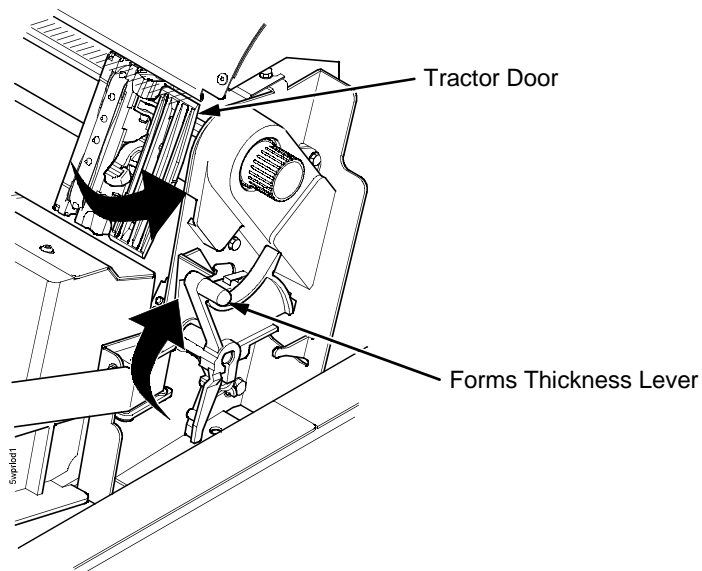
Figure 48. View of the Forms Thickness Lever in the Raised Position

    2.   Raise the forms thickness lever as far as it will go.

    3.   Open the tractor doors.
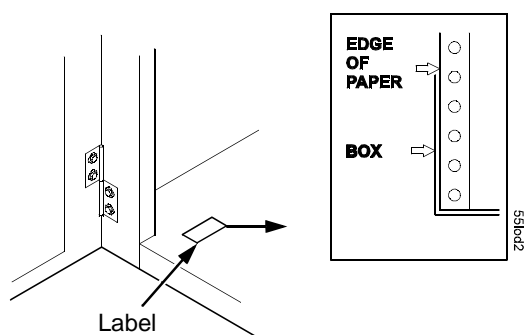
Label

Figure 49. Interior Rear View of the Cabinet Model Paper Supply Label Location

4.   Prepare the paper supply:

Cabinet models:

a.   Open the front door of the printer cabinet.

b.   Place the paper supply inside the printer, on the floor of the cabinet.

c.   Align the paper supply with the front label on the floor of the printer.

d.   Ensure that the paper pulls freely from the box.

Paper Slot

Paper Slot

Cabinet Model   **Pedestal Model**
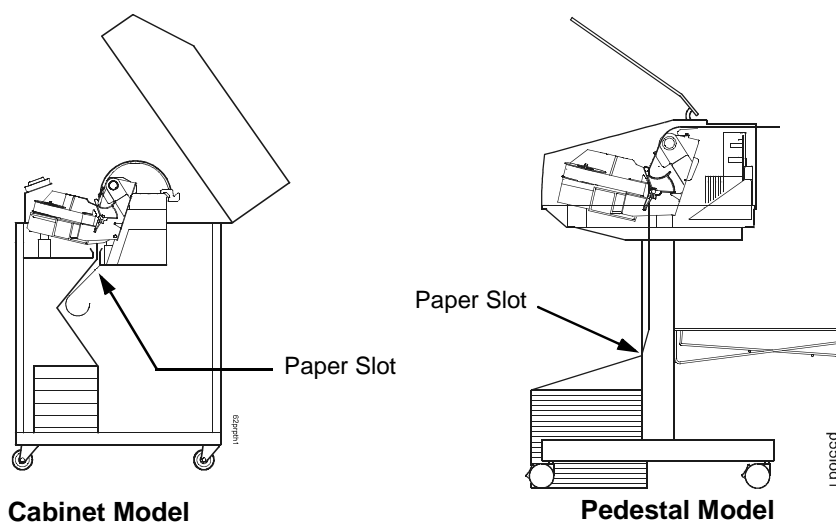
Figure 50. Side View of the Cabinet and Pedestal Models Paper Feed

Pedestal models:

a.   Place the paper supply on the floor in front of the printer, or on the optional paper shelf, if attached.

b.   Ensure that the paper pulls freely from the box.

5. Feed the paper up through the paper slot.

NOTE: Be sure the paper feeds between the two wire guides.

Only the 6400-i20, -i2s, and -i24 printer models contain the paper path guide as shown in Figure 50.

6. 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.

7. Pull the paper above and behind the ribbon mask, which is a silver metal strip with a clear plastic edge protector. Refer to the ribbon path diagram on the shuttle cover.
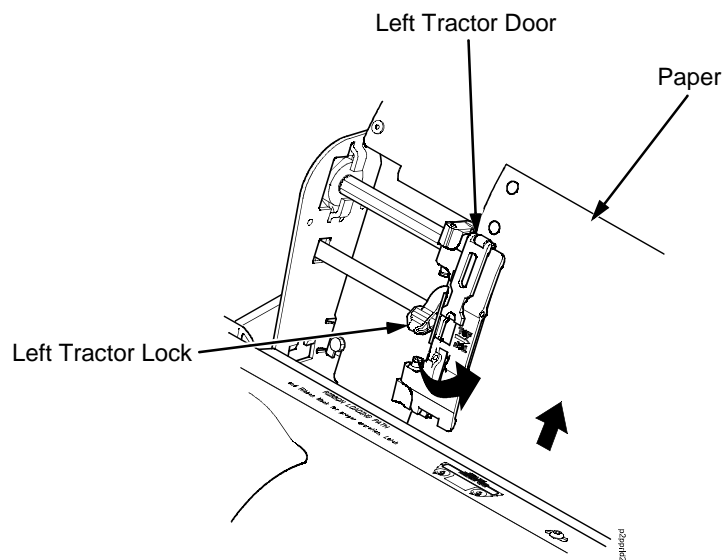
Figure 51. View of Paper Loaded Onto the Left Tractor with Door Closed and Tractor Lock Lowered

8. Load the paper onto the left tractor sprockets.

9. Close the left tractor door.

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.
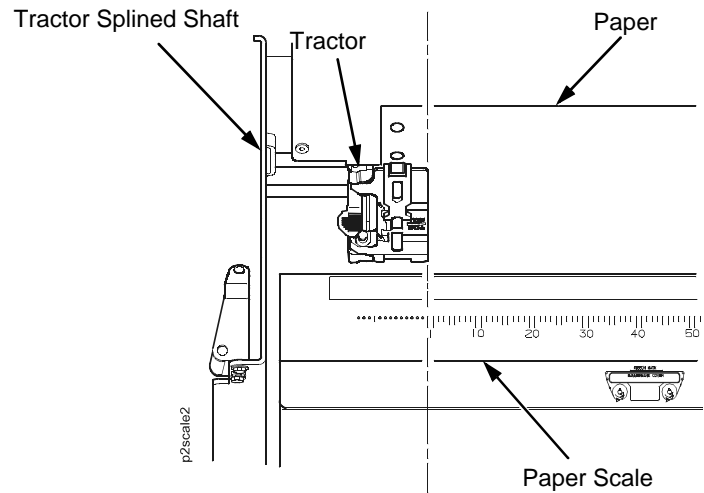
Figure 52. View of the Paper Scale Used as a Guide

10. 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.
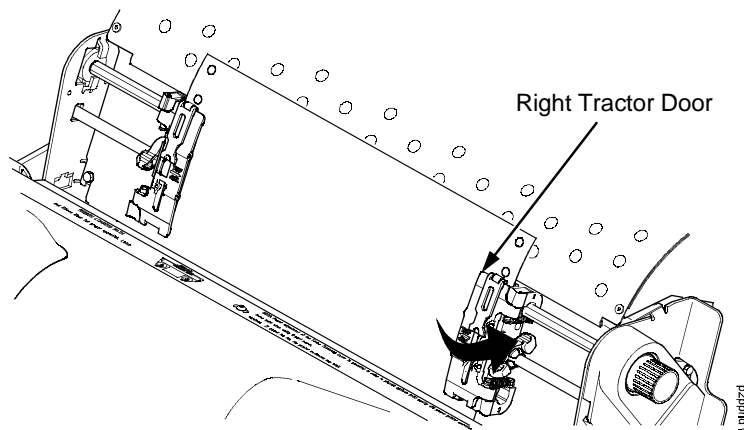
Right Tractor Door

Figure 53. Paper Loaded onto the Right Tractor Sprockets

11. Unlock the right tractor.

12. Load the paper onto the right tractor sprockets.

13. Close the tractor door.

14. 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.

15. Slide the right tractor to remove the paper slack or to adjust for various paper widths.

16. Lock the tractor.
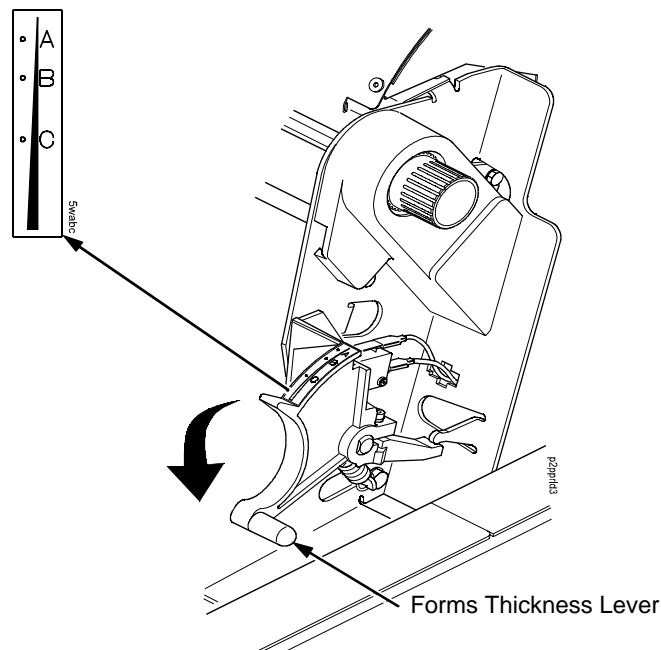
Figure 54. The Forms Thickness Lever in the Lowered Position

17. Turn the vertical position knob to feed the paper up into the paper guide assembly.

18. 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.

19. Press STOP to remove the "LOAD PAPER" fault message from the display.

20. 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.

21. Close the printer cover.

22. Close the cabinet door.

23. 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 77.

71

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.
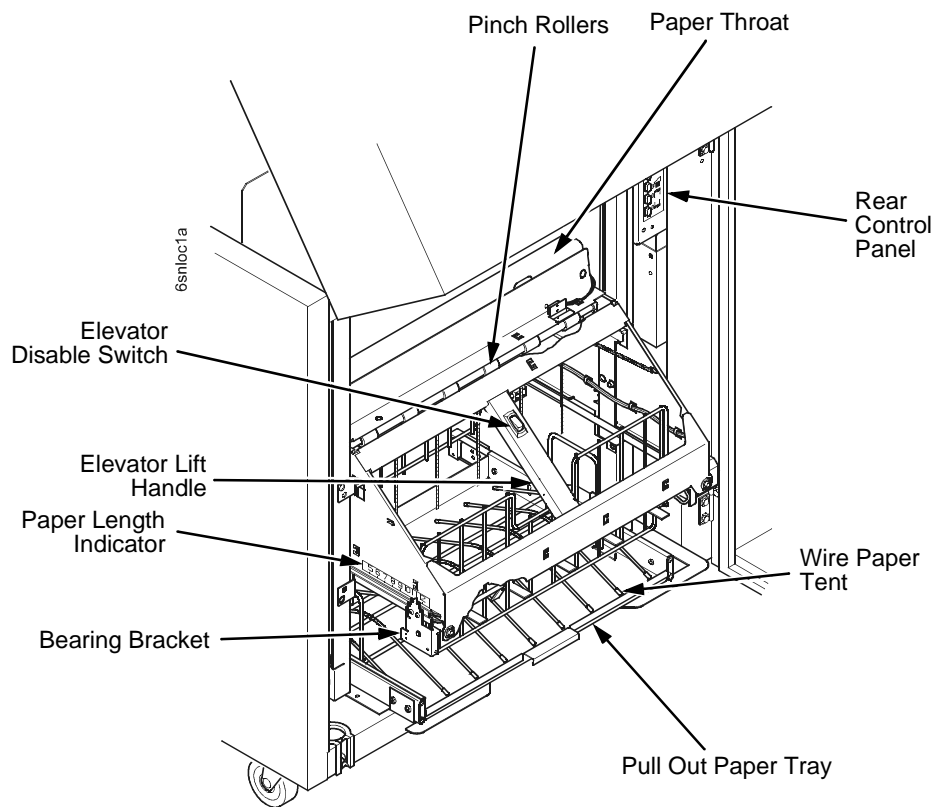
Figure 55. View of the Power Paper Stacker Component Locations

Setting Up The Power Paper Stacker
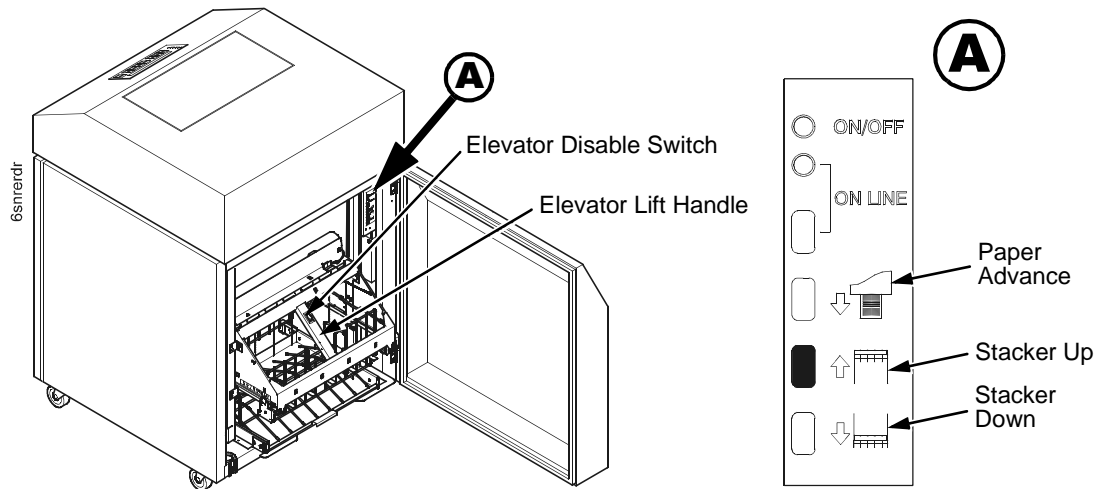
Figure 56. Cabinet Model Rear Door Open Showing Rear Operator Panel

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.
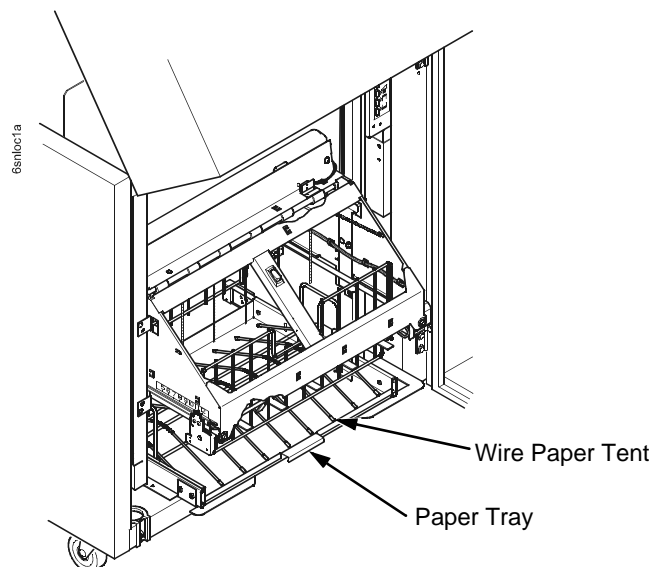
Figure 57. Rear View of Cabinet Model Showing Power Stacker Components

4. Make sure the wire paper tent is fitted in the pull out paper tray in the base of the stacker.
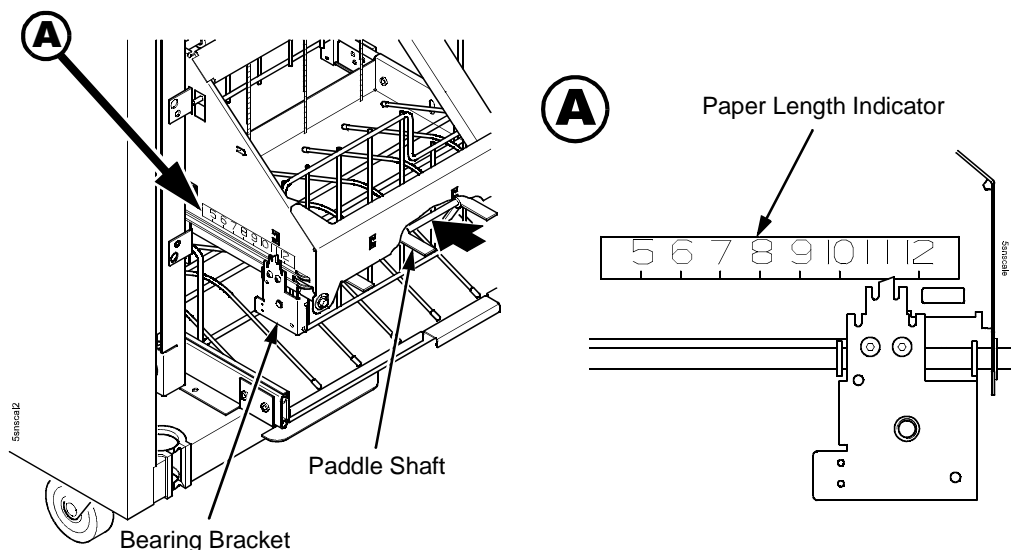
Figure 58. Interior Side View of the Cabinet Model Showing the Paper Length Indicator

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
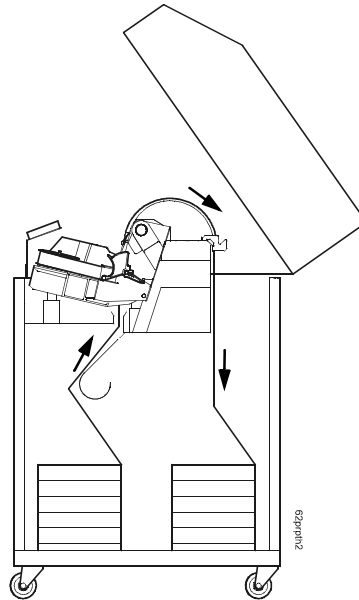
Figure 59. Side View of the Cabinet Model Showing Paper Feed Route

Cabinet Models:

1. Check that the paper feeds correctly.

2. Press the **Form Feed** key several times to ensure that the paper feeds properly beyond the tractors and over the paper guide assembly.

3. Ensure that the paper folds the same way in the stacking area as it does in the supply area.

4. Close the front and rear cabinet doors, if the length of the form allows.
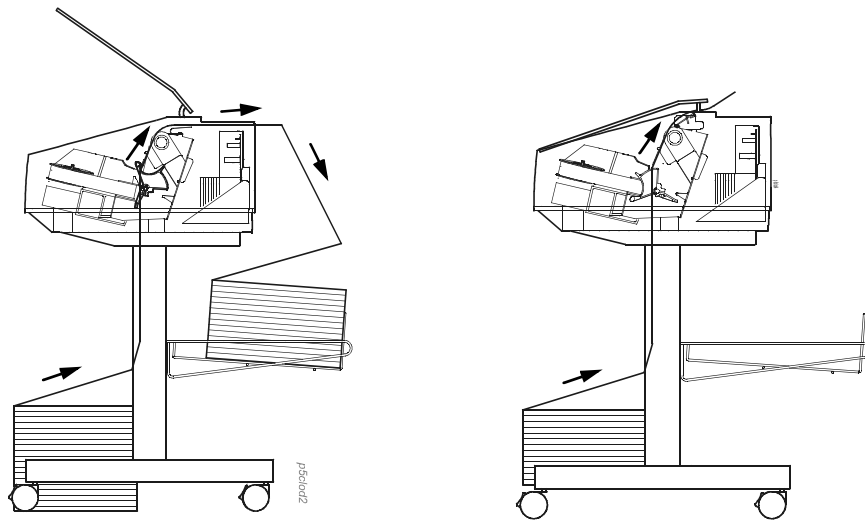
Figure 60. Side View of the Pedestal Model Showing Paper Feed Routes

Pedestal Models:

NOTE: When using the top exit paper path, paper cannot 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.

- **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.

Set The Top-of-Form
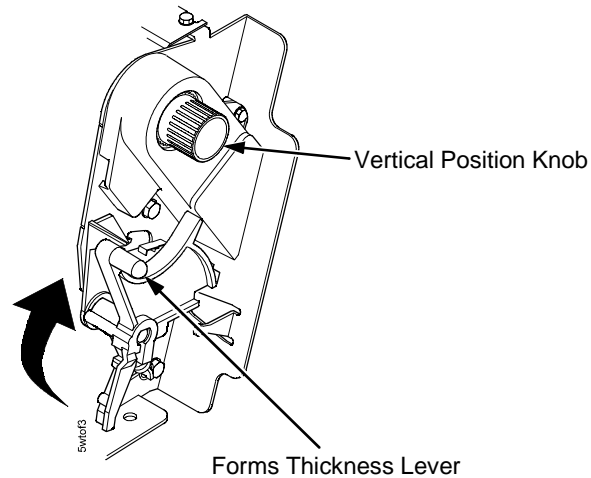
Figure 61. The Forms Thickness Level in the Raised Position

1. Raise the forms thickness lever as far as it will go. The "CLOSE PLATEN" message appears on the operator panel.

2. Press any key on the operator panel to silence the alarm.
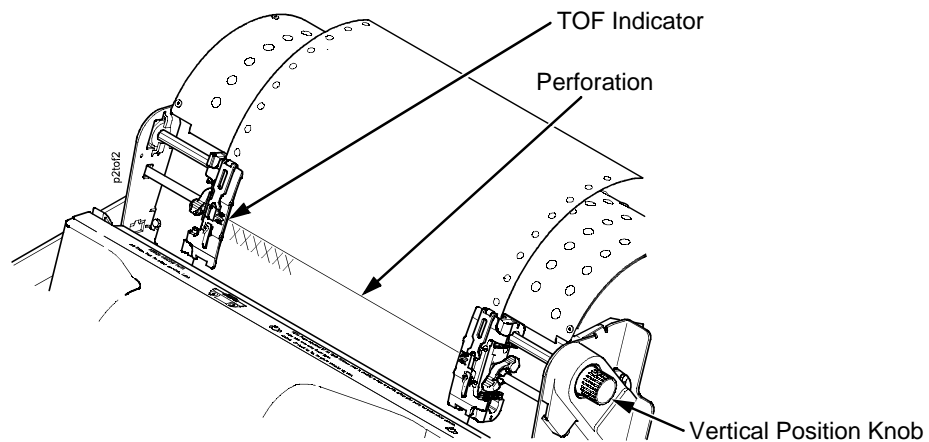
Figure 62. The First Print Line Aligned with the TOF Indicator

3. Locate the TOF indicator. It is the small tab located on the left tractor door.

4. Turn the vertical position knob up or down to align the top of the first print line with the TOF indicator. For best print quality, it is recommended that the top-of-form be set at least 1/2 inch below the perforation.

NOTE: For exact positioning, press the Micro ↑ or Micro ↓ keys to move the paper vertically in 1/72 inch increments. The keys work in both online and offline mode.
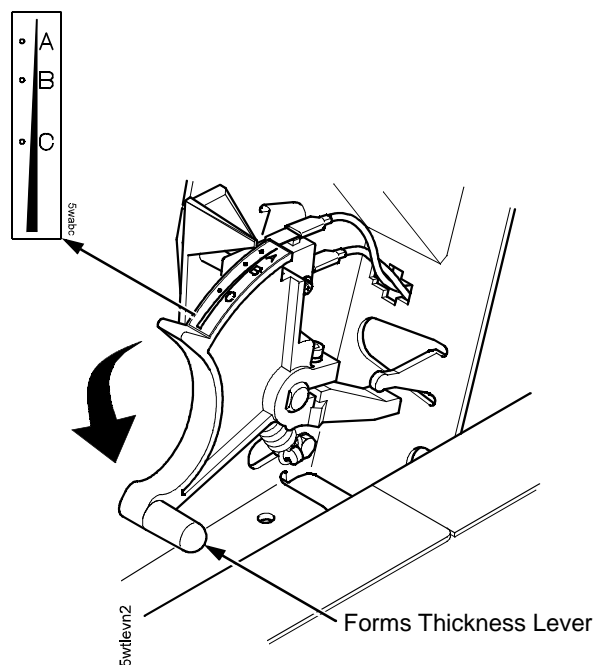
Figure 63. The Forms Thickness Lever in the Lowered Position

5. Lower the forms thickness lever. The CLOSE PLATEN fault clears automatically.

6. 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).

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.

7. Press **Set Top of Form**. The paper moves downward to the top-of-form print position.

Test The Printer

To run an initial printer test, print the current configuration page. See "Printing The Current Configuration" on page 85.

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 service representative.

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

3 *Configuring the Printer*

Overview

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.

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 87.

- Four configurations that you can customize for unique print job requirements. The process of creating customized configurations is explained on page 92.

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 111.)

The Configuration Main Menu

Figure 64 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, "The Configuration Menus" on page 103.

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 on page 15.

Printer Control page 106	**Configuration Management** page 113	**Twinax Interface** [1] page 117	**Coax Interface** [1] page 126	**5250 Interface** [10] page 139 →
Interface Selection	Recall Custom Set	Print Language	Print Language	Print Language
Display Language	Save Current Values	Print Character Table [7]	Print Character Table	Print Character Table
Alarm Control	Delete Custom Set	Active Print Language	Active Print Language	Active Print Language
Print Direction	Change Power On Set	Printer Emulation	PA1	Hex Transparent Control
Hex Print Mode	Protect Custom Sets	Printer Address	PA2	Undefined Character
Power On State	Print Custom Set Values	World Trade	Buffer Reprint	Reporting
Paper Jam Detection	Name Custom Sets	Cancel Buffers	Printer Emulation [9]	Undefined Character
Forms Speed	Reset Custom Set Names	Early Print Complete [2]	Early Print Complete	Substitution
Set Platen at Bottom		Hex Transparent Control	SCS Buffer Control	Print Text Direction
of Form		Undefined Character	Cancel Buffers	Override Host
Shuttle Timeout		Reporting	Hex Transparent Control	Format Control
Energy Saver Timer		Undefined Character	Mono/Dual Case	Maximum Print Width
OCR Font Density		Substitution	Undefined Character	
Eject/Restore		Load Alternate	Substitution	
PTR Setup Option		Character Option	Print Text Direction	
File System		LAC Approximation	Image Buffer Size	
Power Stacker[6]		Print Text Direction	Intervention Required	
Auto Elevator[6]		Override Host	Compatibility Options	
Print Line Select[11]		Format Control	Translate Table	
Single Bank Select[11]		Maximum Printable	Override Host	
		Width	Format Control	
		Hex Print Mode	Maximum Printable	
		C/T Hotport [8]	Width	
			C/T Hotport [8]	
			Hex Print Mode	

NOTE: [1] The Twinax and Coax interface menus only appear in the menus if the IBM Coax/Twinax feature is installed.

[2] The Early Print Complete option appears in the Twinax menu only if the IPDS feature is installed.

[3] IPDS, Code V Emulation, and IGP Emulation options appear in the menus only if these features are installed. Menus are shown in Appendix D.

[4] Ethernet information only appears when the ethernet feature is installed.

[5] Either the Network Setup menu or the Parallel Interface menu will display. They cannot display at the same time.

[6] If installed.

[7] Not if 4234-12 is running IPDS code.

[8] Only if Autoswitching is enabled.

[9] Only if Coax Emulation is enabled.

[10] The 5250 and 3270 Interface menu only appear in the menus if the TN5250/3270 feature is installed.

[11] 6400-i20 and -i24 models only.

Figure 64. Configuration Main Menu

3270 Interface [10] page 145	**Network Setup[6]** page 155	**Parallel Interface [5]** page 170	**Serial Interface** page 180
Print Language	Adapter Address	Interface Type	Interface Type
Print Character Table	Adapter Parameters	PC Parallel	Data Protocol
Active Print Language	Ethernet Address	Dataproducts	Baud Rate
Early Print Complete	Ethernet Parameters	IEEE 1284	Data Bits
Hex Transparent Control	Wireless Address	Parallel Hotport	Stop Bits
Mono/Dual Case	Wireless Parameters		Parity
Undefined Character Substitution			Data Terminal Ready
Print Text Direction			Request to Send
Intervention Required			Buffer Size in Kilobytes
Compatibility Options			Poll Character
Override Host			One Char Enquiry
Format Control			Serial Hotport
Maximum Printable Width			Framing Errors

Emulation Configuration page 186	**Operator Print Tests** page 242	**Printer Information** page 244	**RibbonMinder** page 245
Active Emulation	Printer Demonstration*	Installed Memory	New Ribbon
IPDS [3]	Print Error Log	Power On Time	Ribbon Action
ANSI[6]	Ripple Print	Printing Time	Ribbon Type
IGP Emulation [3]	All E's	Print Strokes	Ribbon End Point
Code V Emulation [3]	All H's	11 Inch Pages	New Ribbon Detect
ASCII Printer Emulation	All E's + FF		
Printer Emulation Configuration	Underlines		
Print Format	Adapter Test Page [4]		
	Ethernet Test Page [4]		

Figure 64. Configuration Main Menu (con't)

Using The Operator Panel
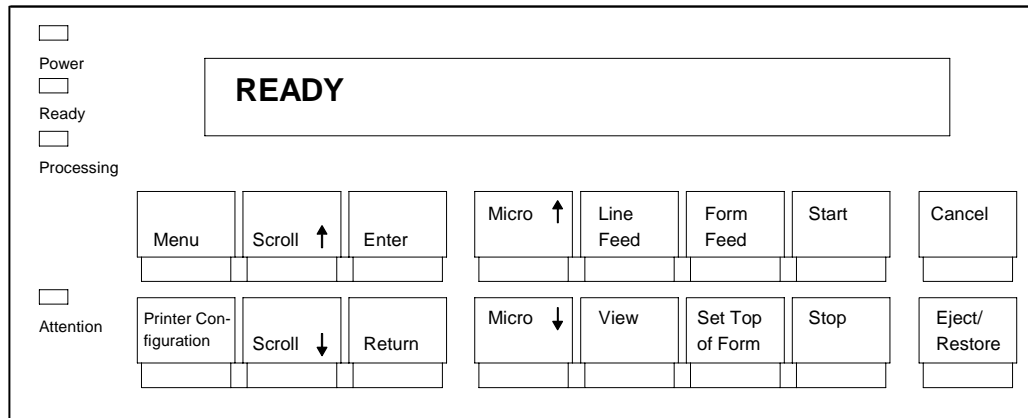
Figure 65. The Operator Panel

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.

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

To use the operator panel to change the configuration settings, Program mode must be unlocked. When Program mode is unlocked, pressing the **Enter** key selects configuration values as the active values, that is, places them into printer DRAM. 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.
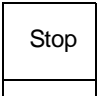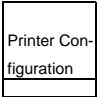
Press the **Scroll↑ + Scroll↓** keys at the same time to lock Program mode. The following message will appear briefly:

```
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 Configuration	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.

* = Factory Default

```
┌─────────────────┐
│ Configuration   │
│ Management      │
└─────────────────┘
```

Recall Custom Set · Save Current Values · Delete Custom Set · Change Power On Set · Protect Custom Sets · Print Custom Set Values

Current Custom Set*
Factory Default
Power On Custom Set
All 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

Name Custom Sets — Reset Custom Set Names

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 113.

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.

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

POWER ON CURRENT CONFIGURATION - FACTORY CONFIGURATION
IBM Printer Configuration
File Part Number XXXXXXX Date XX-XXX-XXXX
Reference Number XXXXXX

DC	V2.04D XX-XXX-XX #XXXXXX
EC	V2.01B XX-XXX-XX #XXXXXX
BOOT/CMX	V1.05E XX-XXX-XX #XXXXXX
SHUTTLE TYPE	1500
FLASH	8 MB
DRAM	8 MB
SECURITY PAL	XXXXXX-XXX
CONFIGURATION CODE	FC06FF

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 Detection	Enable
Forms Speed	Normal Speed
Set Platen at Bottom of Form	Disable
Shuttle Timeout	5 Seconds
Energy Saver Timer	15 Minutes
OCR Font Density	120 Dots Per Inch
Eject/Restore	Standard
PTR Setup Option	
Setup Parse	Disable
Setup SFCC	21h
File System	
Overwrite Files	Enable
View File List	
93779.sf	177228 Bytes
Plugin.cdm	122066 Bytes
HQ3UPDT.cdm	53480 Bytes
Pluginfp.cdm	206161 Bytes
IF.fnt	339 Bytes
HQ3.fnt	444 Bytes
UIF.ss	21646 Bytes
Plugin.ttf	26928 Bytes
UTT.ss	16582 Bytes
Version	67 Bytes

Network.dat	1210 Bytes
PTXLogo.gif	1210 Bytes
Ethload	2191652 Bytes
Printron.ec1	262400 Bytes

Optimize&Reboot
Print File List

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	All Custom Sets

PARALLEL INTERFACE

Interface Type	PC Parallel

PC Parallel

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 Kilobytes	16

Dataproducts

Data Bit 8	Enable
PI Ignored	Enable
Data Polarity	Standard
Data Request Polarity	Standard
Strobe Polarity	Standard

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 and Buffer Not Full
Request to Send	True
Buffer Size in Kilobytes	16
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
Active Graphic Emulation   IGP
IGP Emulation
    Define CR Code   CR = CR
    Define LF Code   LF = LF
    Auto LF   Disable
    Select SFCC   7E
    PI Slew Range   16
    CR Edit   Disable
    Select Font   0
    Slash 0   Disable
    Lines Per Inch   6 Lines Per Inch
    Mono/Dual Case   Dual Case
    Skip Command Prefix   Enable
    Power on IGP   Enable
    Ext Execute Copy   Disable
    UPC Descenders   Enable
    Compressed CPI   Disable
    Ignore Character
        Ignore Mode   Disable
        Select Character   0
    IGP100 Compatibility   None
    Expanded Font   Block
    Optimized Ratio   Disable
ASCII Printer Emulation   P-Series Emulation
Printer Emulation Configurations
    Proprinter III XL Emulation
        Print Language   0437 PC Character Set
        Alternate Character Set PC Character Set 1
        Define CR Code   CR = CR
        Auto LF   Enable
        Define LF Code   LF = LF
        FF Valid at TOF   Enable
        20 CPI Condensed Enable
Epson Emulation
    Character Sets   Epson Set
    Epson Print Language   ASCII (USA)
    Define CR Code   CR = CR
    Auto LF   Enable
    Define LF Code   LF = LF
    Printer Select   Disable
    20 CPI Condensed   Enable

P-Series Emulation
    Character Sets   IBM PC
    Print Language
        IBM PC   ASCII (USA)
        Multinational   ASCII (USA)
        EMCA Latin 1
        DEC Multinational   ASCII (USA)
    Control Code 06   8.0 LPI
    Control Code 08   Elongated
    Define CR Code   CR = CR
    Auto LF   Disable
    Overstrike   Enable
    Define LF Code   LF = CR + LF
    Select SFCC   1
    Alternate Set 80 - 9F   Control Code
P-Series XQ Emulation
    Control Code 06   8.0 LPI
    Define CR Code   CR = CR
    Auto LF   Disable
    Define LF Code   LF = CR + LF
    Compressed Print   Char 01 SOH
    Elong/Alt. Font   Elng = BS Font = SO
    High Speed Print Mode Char 02 STX
    EVFU Select   Enable
    Upper Case Select   Disable
    Slew Relative   1 to 16 Lines
Serial Matrix Emulation
    Character Sets   IBM PC
    Print Language
        IBM PC
        Multinational
        Control Code 06   8.0 LPI
        Define CR Code   CR = CR
        Auto LF   Enable
        Overstrike   Enable
        Define LF Code   LF = LF
        Printer Select   Disable
        Alternate 80 - 9F   Control Code
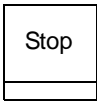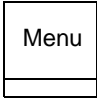
Print Format
    Characters Per Inch   10.0 Characters Per Inch
    Lines Per Inch   6.0 Lines Per Inch
    DBCS CPI   6.7 CPI
    Forms Width
        Forms Width in inches 13.6 inches
        Forms Width in MM   345.4 MM
        Forms Width in
        Characters   136 Characters
    Forms Length
        Forms Length in inches 11.0 inches
        Forms Length in mm   279.4 mm
        Forms Length in lines 66 lines
    Print Quality   DP Quality
    Print Character Table
    Print Attributes
        Proportional Spacing   Disable
        Italic Print   Disable
        Slashed Zero   Disable
        Text Position   Bottom of Line
    Margins
        Left Margin   0 Characters
        Right Margin   0 Characters
        Bottom Margin   0 Lines
    Perforation Skip   Disable
    Reset Command   Load Factory

OPERATOR PRINT TESTS   Printer Demonstration
PRINTER INFORMATION
Installed Memory   8 MB
Power On Time: XXX.X Hours
Printing Time: XX Hours
Print Strokes   XXXXXXX
11 Inch Page   XXXX

RIBBONMINDER
    New Ribbon   99%
    Ribbon Action   Display
    Ribbon Type   Gold Series 90
    Ribbon End Point   Normal
    New Rib. Detect   Enable
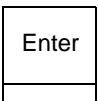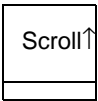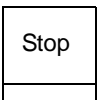
Changing Parameters
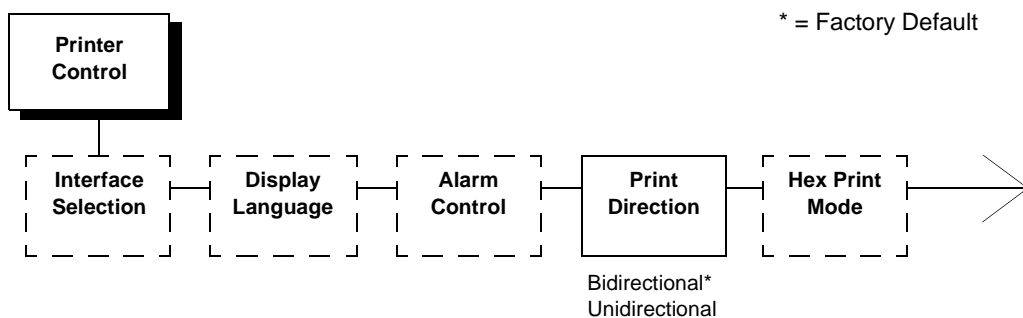
* = Factory Default

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: 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.

Step	Key	LCD Results	Notes
5.	Enter	PRINTER CONTROL INTERFACE SELECTION	Moves into the PRINTER CONTROL menu.
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 "" on page 94. If you want to use these values without saving, 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

* = Factory Default

```
Configuration
Management
  │
  ├── Recall        Save Current    Delete        Change         Protect        Print Custom
      Custom Set    Values          Custom Set    Power On Set   Custom Sets    Set Values
                      │
                      1*
                      2
                      3
                      4
                      5
                      6
                      7
                      8

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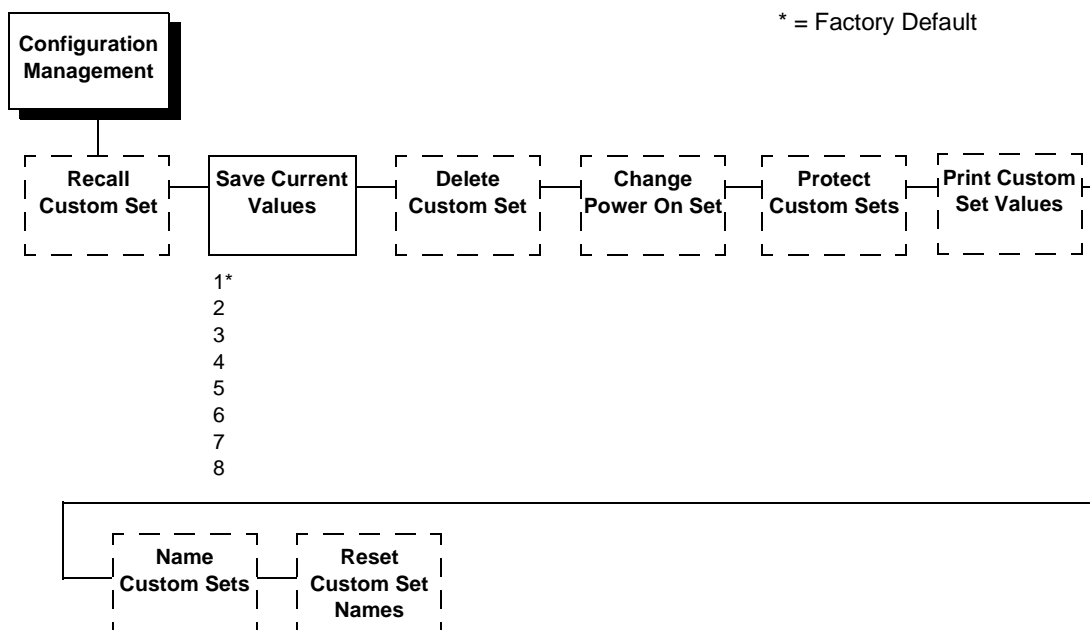
Once you have changed all of the necessary parameters, it is recommended you save them as a configuration that can be stored and loaded later for future use. You can save your configurations to meet different print job requirements.

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 97 for details on loading configurations.

You may want to print records of your configurations (see page 85) 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 115 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 PRINTER CONTROL	Displays the first Configuration Main Menu option, PRINTER CONTROL.
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 1*	Selects the SAVE CURRENT VALUES menu.
8.	Scroll↑ UNTIL	SAVE CURRENT VALUES 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.

Step	Key	LCD Results	Notes
10.	Stop	NOT READY	Returns the printer to the NOT READY mode.
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 print your current configuration, as described on page 85.

Loading Custom Sets Or Factory Default Values

* = Factory Default

```
┌─────────────────┐
│ Configuration   │
│ Management      │
└─────────────────┘
```

| Recall Custom Set | Save Current Values | Delete Custom Set | Change Power On Set | Protect Custom Sets | Print Custom Set Values |

Factory Default*
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

| Name Custom Sets | Reset Custom Set Names |
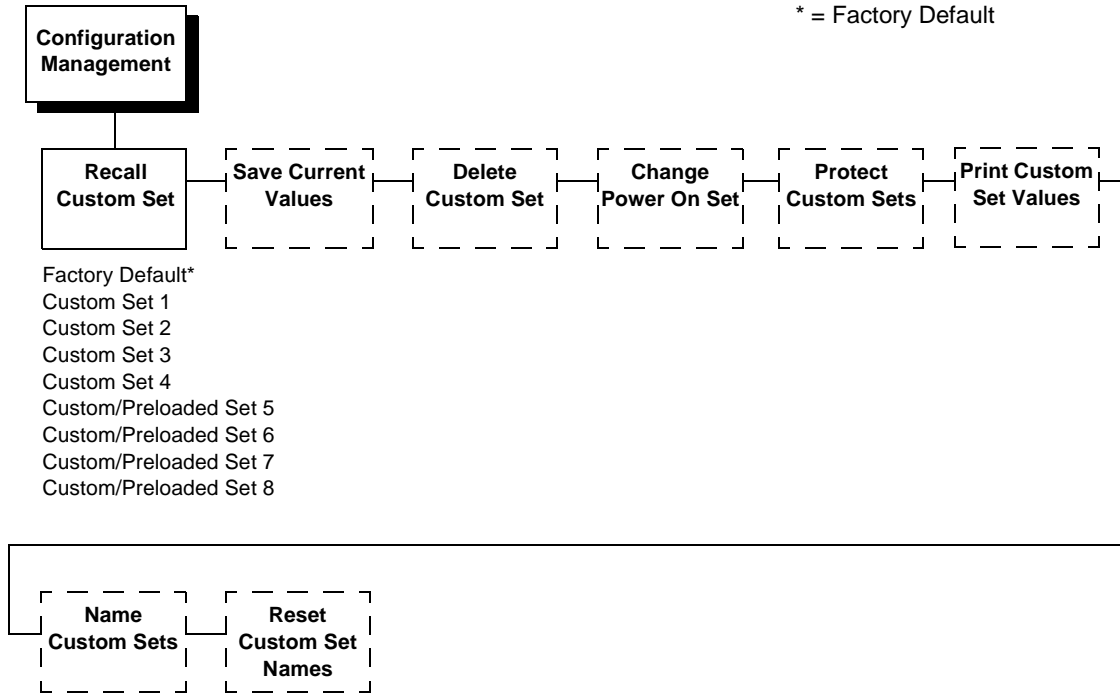
You can load any of the custom set configurations or the factory default configuration. Factory default parameters are shown starting on page 87. The loaded configuration remains active as long as the printer is on. The following procedure shows how to load factory defaults to the printer.

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 99.

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 PRINTER CONTROL	Displays the first Configuration Main Menu option, PRINTER CONTROL.
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.

Step	Key	LCD Results	Notes
10.	Stop	READY	Places the printer in READY mode, prepared for normal operation.

Changing The Power On Configuration

* = Factory Default

Configuration Management

Recall Custom Set — Save Current Values — Delete Custom Set — **Change Power On Set** — Protect Custom Sets — Print Custom Set Values

Factory Default*
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

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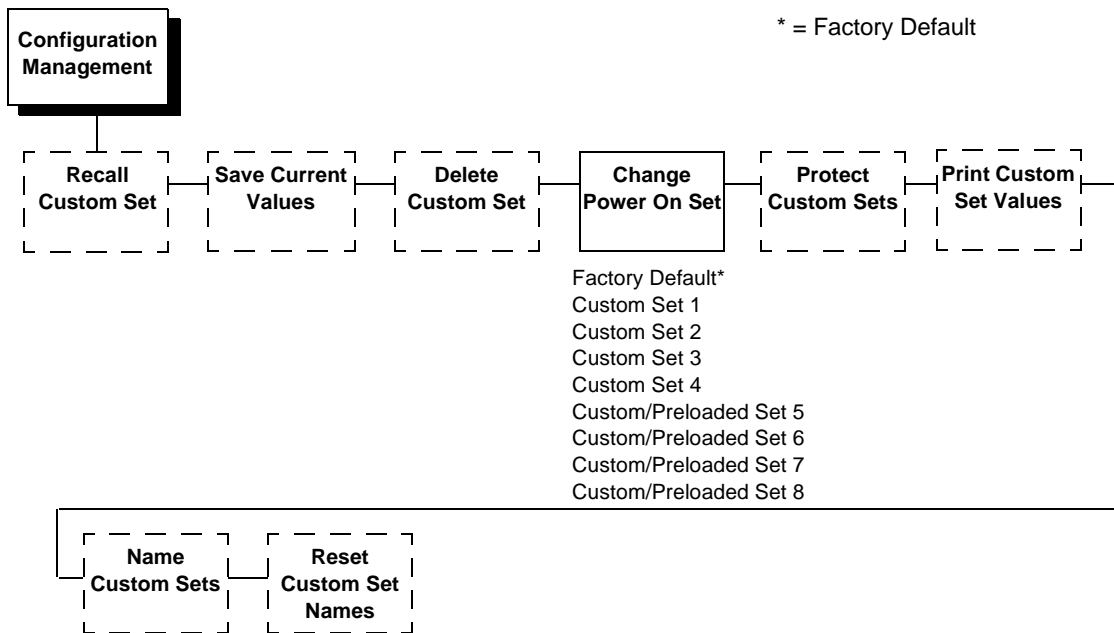
When you power on the printer for the first time, it loads the factory default configuration. If you power the printer off and then back on, the printer will load the designated power-on configuration (which is set to Factory Default by default). It will not load the last saved configuration.

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 PRINTER CONTROL	Displays the first Configuration Main Menu option, PRINTER CONTROL.
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.

Step	Key	LCD Results	Notes
10.	Stop	NOT READY	Returns the printer to the NOT READY mode.
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   *The Configuration Menus*

Configuration 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" on page 79.

Figure 66 shows an overview of the configuration menus.

> The menus that are displayed from the operator panel are determined by the installed features. For example, if you ordered the IPDS feature, then the IPDS menu would appear on the operator panel. If the IPDS feature is not installed, then the IPDS menu will not appear on the operator panel.
>
> Each feature is shipped with a document that describes the feature in detail. For more information about these documents, see "Related Documents" on page 15.

The configuration menu diagram on page 104 shows 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.

These keys are summarized in a legend box at the lower right corner of each configuration menu diagram.

Main Menu

Printer Control page 106	Configuration Management page 113	Twinax Interface [1] page 117	Coax Interface [1] page 126	5250 Interface [10] page 139
Interface Selection	Recall Custom Set	Print Language	Print Language	Print Language
Display Language	Save Current Values	Print Character Table [7]	Print Character Table	Print Character Table
Alarm Control	Delete Custom Set	Active Print Language	Active Print Language	Active Print Language
Print Direction	Change Power On Set	Printer Emulation	PA1	Hex Transparent Control
Hex Print Mode	Protect Custom Sets	Printer Address	PA2	Undefined Character Reporting
Power On State	Print Custom Set Values	World Trade	Buffer Reprint	Undefined Character Substitution
Paper Jam Detection	Name Custom Sets	Cancel Buffers	Printer Emulation [9]	Print Text Direction
Forms Speed	Reset Custom Set Names	Early Print Complete [2]	Early Print Complete	Override Host
Set Platen at Bottom of Form		Hex Transparent Control	SCS Buffer Control	Format Control
Shuttle Timeout		Undefined Character Reporting	Cancel Buffers	Maximum Print Width
Energy Saver Timer		Undefined Character Substitution	Hex Transparent Control	
OCR Font Density		Load Alternate Character Option	Mono/Dual Case	
Eject/Restore		LAC Approximation	Undefined Character Substitution	
PTR Setup Option		Print Text Direction	Print Text Direction	
File System		Override Host	Image Buffer Size	
Power Stacker[6]		Format Control	Intervention Required	
Auto Elevator[6]		Maximum Printable Width	Compatibility Options	
Print Line Select[11]		Hex Print Mode	Translate Table	
Single Bank Select[11]		C/T Hotport [8]	Override Host	
			Format Control	
			Maximum Printable Width	
			C/T Hotport [8]	
			Hex Print Mode	

NOTE: [1] The Twinax and Coax interface menus only appear in the menus if the IBM Coax/ Twinax feature is installed.

[2] The Early Print Complete option appears in the Twinax menu only if the IPDS feature is installed.

[3] IPDS, Code V Emulation, and IGP Emulation options appear in the menus only if these features are installed. Menus are shown in Appendix D.

[4] Ethernet information only appears when the ethernet feature is installed.

[5] Ether the Ethernet Interface menu or the Parallel Interface menu will display. They cannot display at the same time.

[6] If installed.

[7] Not if 4234-12 is running IPDS code.

[8] Only if Autoswitching is enabled.

[9] Only if Coax Emulation is enabled.

[10] The 5250 and 3270 Interface menu only appear in the menus if the TN5250/3270 feature is installed.

[11] 6400-i20 and -i24 models only.

Figure 66. 6400-I Series Main Menu Configuration

◄──────

3270 Interface [10] page 145	**Network Setup** [6] page 155	**Parallel Interface** [5] page 170	**Serial Interface** page 180

Print Language
Print Character Table
Active Print Language
Early Print Complete
Hex Transparent Control
Mono/Dual Case
Undefined Character
  Substitution
Print Text Direction
Intervention Required
Compatibility Options
Override Host
Format Control
Maximum Printable Width

Adapter Address
Adapter Parameters
Ethernet Address
Ethernet Parameters
Wireless Address
Wireless Parameters

Interface Type
PC Parallel
Dataproducts
IEEE 1284
Parallel Hotport

Interface Type
Data Protocol
Baud Rate
Data Bits
Stop Bits
Parity
Data Terminal Ready
Request to Send
Buffer Size in
  Kilobytes
Poll Character
One Char Enquiry
Serial Hotport
Framing Errors

Emulation Configuration page 186	**Operator Print Tests** page 242	**Printer Information** page 244	**RibbonMinder** page 245

Active Emulation
IPDS [3]
ANSI [6]
IGP Emulation [3]
Code V Emulation [3]
ASCII Printer
  Emulation
Printer Emulation
  Configuration
Print Format

Printer Demonstration*
Print Error Log
Ripple Print
All E's
All H's
All E's + FF
Underlines
Adapter Test Page [4]
Ethernet Test Page [4]

Installed Memory
Power On Time
Printing Time
Print Strokes
11 Inch Pages

New Ribbon
Ribbon Action
Ribbon Type
Ribbon End Point
New Ribbon Detect

Printer Control Menu

Printer Control
(From page 104)

Interface Selection	**Display Language**	**Alarm Control**	**Print Direction**	**Hex Print Mode**	**Power On State**
Parallel*	English*	Alarm Enabled*	Bidirectional*	Disable*	Ready*
Serial	German	Alarm Disabled	Unidirectional	Enable	Not Ready
Autoswitching	French				
Twinax* [1]	Italian				
Coax [1]	Spanish				
Ethernet [4]	Dutch				
	Portuguese				

Paper Jam Detection	**Form Speeds**	**Set Platen at Bottom of Form**	**Shuttle Timeout**	**Energy Saver Timer**	**OCR Font Density**
Enable*	Normal Speed*	Disable*	5 Seconds*	15 Minutes*	120 Dots Per Inch*
Disable	Slow Speed	Open	1 - 60 Seconds	1 - 60 Minutes	180 Dots Per Inch
				240 mins	
				Instant	
				5 - 30 Seconds	

Eject/Restore	**PTR Setup Option**	**File System**	**Power Stacker [3]**	**Auto Elevator [3]**	**Print Line Select [5]**
Standard*	Setup Parse	Overwrite Files	Enable*	Enable*	Bar Code Detect*
Top Exit Tear [2]	Disable*	Enable*	Disable	Disable	Graphics Detect
	Enable	Disable			Dual
	Ignore	View File List			Single
	Setup SFCC	Delete Files			
	21h*	Optimize&Reboot			
	1 - FF	Print File List			

Single Bank Select [5]
Upper*
Lower

NOTE:

[1] The Twinax and Coax interface menus only appear in the menus if the IBM Coax/Twinax feature is installed.

[2] Top exit tear path can only be selected on pedestal models.

[3] If the Power Paper Stacker is installed.

[4] Either the Network Setup menu or the Parallel Interface menu will display. They cannot be displayed at the same time.

[5] 6400-i20 and -i24 models only.

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter

To select an option, press:

To exit the configuration menus and return to READY, press: Start

* = Factory Default

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.

When coax or twinax is selected, a POR status is sent to the host. Selecting Autoswitching provides automatic interface switching among parallel, serial, and either coax or twinax 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.

NOTE: When used with serial, parallel, and coax or twinax non-IPDS emulations, 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 as the beginning of each job. It is also the responsibility of the host application program to correctly position the forms at "top of form" and the end of each job. When used with coax or twinax IPDS, Autoswitching does save the state of the IPDS emulation during interface switching and will also correctly position the forms at "top of form" at the end of each IPDS job.

Display Language

This parameter selects the language in which the operator panel messages will display.

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.

- **Alarm Enabled** (the default)
- **Alarm Disabled**

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 qualty 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). Prints all data in both directions of the shuttle sweep. This choice produces higher printing speed.
- **Unidirectional**. Prints 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.

- **Disable** (the default)
- **Enable**

Refer to page 271 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. The mode is not available when printing IPDS.

Power On State

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

- **Ready** (the default)
- **Not Ready**

Paper Jam Detection

This parameter determines whether or not paper jam detection is active.

- **Enable** (the default). Detects paper jams.
- **Disable**. Disables paper jam checking 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 (i.e. invoice), will stack more neatly.

Set Platen at Bottom of Form

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.

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 on page 237.

• **Disable** (the default)

• **Open**

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.

• **5 Seconds** (the default)

• **1 – 60 Seconds**

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 from instant to 60 minutes. The selections are:

• **15 Minutes** (the default)

• **1 – 60 Minutes**

• **240 Mins**

• **Instant**

• **5 – 30 Seconds**.

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.

OCR Font Density

OCR FONT DENSITY determines the print quality for OCR A and OCR B character sets. The following options are available:

- **120 Dots Per Inch** (the default). Vertical is 144; horizontal is 120.

- **180 Dots Per Inch** Vertical is 144; horizontal is 180.

NOTE: The higher the resolution selected, the slower the print speed. When selecting a resolution, try to balance the resolution quality your application requires with how fast you want the print job to print.

Eject/Restore

The EJECT/RESTORE parameter controls how the printer behaves when the user presses 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.

- **Disable** (the default)
- **Enable**
- **Ignore**

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.

- **21h** (the default). Corresponds to the "1" character.
- **1 – FF**

File System

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

- **Overwrite**. 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 turn the printer off 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.

Power Stacker

This parameter determines whether or not the power paper stacker is enabled or disabled. This parameter is not presented if the power paper stacker is not installed.

- **Enable** (the default)
- **Disable**

Auto Elevator

This parameter exists only on printers with the power paper stacker installed. The power stacker has a sensor which detects paper movement and raises the stacker as the printed paper stack grows. If the printer has been printing for three minutes continually and the sensor has not detected any growth in the paper stack, the stacker raises itself 1/4 inch automatically.

- **Enable** (default). The automatic elevator on the power stacker operates normally.

- **Disable**. The stacker does not raise automatically every three minutes and is entirely dependent on the sensor. Disable is used with extremely high-quality print jobs that take a long time to print.

Print Line Select

Determines which hammerbank row to use for printing (upper or lower).

NOTE: Option is applicable in the 6400-i20 and -i24 models only.

- **Bar Code Detect** (the default). Uses both hammerbank rows (upper or lower) to print all information except for barcodes.

- **Graphics Detect**. Uses a single hammerbank row to print graphics and barcodes.

- **Dual**. Uses both hammerbank rows when possible.

- **Single**. Uses either the upper or lower hammerbank row, depending on the menu option you select.

Single Bank Select

The printer has a dual hammerbank with upper and lower rows of hammers. If there is a problem such as a broken hammer, the user can select upper or lower. The Diagnostics routine alternates the printing between the upper and lower hammerbank, and is not recommended for normal use, only for troubleshooting.

- **Upper** (the default)

- **Lower**

NOTE: Option is applicable in the 6400-i20 and -i24 models only. For more details on Diagnostics, refer to the *Maintenance Information Manual*.

Configuration Management Menu

The CONFIG. CONTROL menu allows you to control your printer's configurations according to the specifications necessary for your print jobs.

**Configuration
Management**
(from page 104)

| Recall
Custom Set | Save
Current Values | Delete
Custom Set | Change
Power On Set |
|---|---|---|---|
| Factory Default* | Custom Set 1* | Custom Set 1* | Factory Default* |
| Custom Set 1 | Custom Set 2 | Custom Set 2 | Custom Set 1* |
| Custom Set 2 | Custom Set 3 | Custom Set 3 | Custom Set 2 |
| Custom Set 3 | Custom Set 4 | Custom Set 4 | Custom Set 3 |
| Custom Set 4 | Custom/Preloaded Set 5 | Custom/Preloaded Set 5 | Custom Set 4 |
| Custom/Preloaded Set 5 | Custom/Preloaded Set 6 | Custom/Preloaded Set 6 | Custom/Preloaded Set 5 |
| Custom/Preloaded Set 6 | Custom/Preloaded Set 7 | Custom/Preloaded Set 7 | Custom/Preloaded Set 6 |
| Custom/Preloaded Set 7 | Custom/Preloaded Set 8 | Custom/Preloaded Set 8 | Custom/Preloaded Set 7 |
| Custom/Preloaded Set 8 | | | Custom/Preloaded Set 8 |

| Protect
Custom Sets | Print Custom
Set Values | Name Custom
Sets | Reset Custom
Set Names |
|---|---|---|---|
| Disable* | Current Custom Set* | Custom Set 1 | Custom Set 1 |
| Enable | Factory Default | Custom Set 2 | Custom Set 2 |
| | Power On Custom Set | Custom Set 3 | Custom Set 3 |
| | All Custom Sets | Custom Set 4 | Custom Set 4 |
| | Custom Set 1 | Custom/Preloaded Set 5 | Custom/Preloaded Set 5 |
| | Custom Set 2 | Custom/Preloaded Set 6 | Custom/Preloaded Set 6 |
| | Custom Set 3 | Custom/Preloaded Set 7 | Custom/Preloaded Set 7 |
| | Custom Set 4 | Custom/Preloaded Set 8 | Custom/Preloaded Set 8 |
| | Custom/Preloaded Set 5 | | All Custom Sets |
| | Custom/Preloaded Set 6 | | |
| | Custom/Preloaded Set 7 | | |
| | Custom/Preloaded Set 8 | | |

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

113

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** (the default). 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.

Following is a brief description of Custom/Preloaded Sets 5 – 8:

- **Custom/Preloaded Set 5** is used when configuring this printer to function like a Printronix printer. This custom set contains ASCII emulations used by Printronix compatible printers along with initial defaults (Overstrike, Auto LF, etc.). The initial ASCII default emulation is P-Series which may need to be altered for P-Series XQ or Serial Matrix in some applications. This option is defined only in CT or CT/IPDS builds. For more information, refer to the Configuration Utility Diskette shipped with this printer, or the *6400 ASCII Programmer's Reference Manual.*

- **Custom/Preloaded Set 6** contains the default settings for an ASCII printer using a set of Epson and Proprinter default values. This could be useful when the printer has the Coax/Twinax feature, but is sometimes run as an ASCII printer. This option is defined only in IGP, CT and CT/IPDS builds. Refer to the *6400 Coax/Twinax Programmer's Reference Manual* for more information.

- **Custom/Preloaded Set 7** contains default settings for a Twinax printer without IPDS. This could be useful when the printer contains the IPDS feature, but must occasionally be used as a non-IPDS printer. This option is defined only in CT/IPDS builds. Refer to the *6400 IPDS Programmer's Reference Manual* or the *6400 Coax/Twinax Programmer's Reference Manual* for more information.

- **Custom/Preloaded Set 8** sets up the printer for an external CT Interpreter box. This option is defined only for Non-CT IGP and ASCII builds.

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 custom 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 ALREADY EXISTS
  DELETE FIRST

  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 39-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 menus. 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 a character you have already 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.

Twinax Interface Menu

Twinax Interface [4]
(from page 104)

Print Language	Print Character Table [3]	Active Print Language	Printer Emulation	Printer Address	World Trade

See the following page.

Standard Print Language*
Alternate Print Language

4234-2*
5225
4234-12 [1]

Address 1*
Address 2
Address 3
Address 4
Address 5
Address 6
Address 0

Standard Character Set*
Extended Character Set

Cancel Buffers	Early Print Complete [2]	Hex Transparent Control	Undefined Character Reporting	Undefined Character Substitution	Load Alternate Character Option

Enable*
Disable

Disable*
Enable

Lead-In Characters
  Set 1 <%>*
  Set 2 ¬¬$
  Set 3 _%_
  User Defined
User Defined Codes
  Start Code 1
  Start Code 2
  Stop Code
Alternate Set 80-9F
  Printable*
  Control Code

Enable*
Disable

60*
40 - FE (HEX)

Enable*
Disable

LAC Approximation	Print Text Direction	Override Host	Format Control	Maximum Printable Width	Hex Print Mode [3]	C/T Hotport [5]

On*
Off

Control By Host*
Left to Right
Right to Left

Disable*
Enable

Disable*
Enable

13.2 inches*
13.6 inches

Disable*
Enable

Port Type
  Disable*
  Twinax
  Coax
Timeout
  15 Sec*
  10 Sec - 180 Sec
Report Status
  Disable*
  Enable

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

To select an option, press: **Enter**

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

NOTE:
[1] If the IPDS feature is installed, the 4234-12 option is the default, and will appear in this menu. If IPDS is not installed, the 4234-12 option will not appear in this menu, and 4234-2 becomes the default.
[2] If the IPDS feature is installed, the EARLY PRINT COMPLETE option appears in this menu.
[3] Does not apply to IPDS.
[4] The Twinax and Coax interface menus only appear in the menus if the IBM Coax/Twinax is installed.
[5] Only if Autoswitching is enabled.

Print Language
(from page 139)

Standard Print Language

Alternate Print Language

0037 English (USA/Canada)*
0037 English (Netherlands)
0500 Swiss Bilingual
0500 Belgian New
0273 Austrian/German
0274 Belgian Old
0275 Brazilian
0260 Canadian French
0277 Danish/Norwegian
0278 Finnish/Swedish
0297 French/French Azerty
0280 Italian
0281 Japanese English
0282 Portuguese
0284 Spanish/Spanish Speaking
0285 English (UK/Ireland)
0892 ORC A
0893 ORC B
0424 Hebrew
0803 Hebrew Old (089)
0420 Arabic
0880 Cyrillic Old
0423 Greek Old
0875 Greek New Euro
0871 Icelandic
0290 Japanese Katakana
0870 Latin 2/Roece/Multilingual
0838 Thai
1026 Turkish
0890 Yugoslav Old
1097 Farsi
1025 Cyrillic Multilingual
0256 International Set 1
1112 Baltic Multilingual
0924 Euro Latin 9
1122 Estonian
1140 Euro English (USA/Canada)
1141 Euro Austrian/German
1142 Euro Danish/Norwegian
1143 Euro Finnish/Swedish
1144 Euro Italian
1145 Euro Spanish Speaking
1146 Euro English (UK/Ireland)
1147 Euro French (Azerty 105)
1148 Euro Swiss Bilingual
1149 Euro Icelandic
OCR-B Katakana
0500 International Set 5

English US*
Austrian/German
Belgian
Brazilian
Canadian French
Danish/Norwegian
Finnish/Swedish
French
Italian
Japanese English
Japanese Katakana
Portuguese
Spanish
Spanish Speaking
English UK/Ireland
Multinational

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

To select an option, press: **Enter**

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

Print Language

PRINT LANGUAGE specifies the set of print languages used by the printer. Refer to the previous page for print language menus.

• **Standard Print Language** (the default)

• **Alternate Print Language**. Provides code pages compatible with 6408/ 6412 Model CT0 printers. Use this option with the 5225 printer emulation.

Specifying a print *quality* of OCR A or OCR B will change the print *language* to OCR A or OCR B.

When OCR A or OCR B is selected as the default print language, OCR A and OCR B are the only available values for this print quality. If a different print quality value is desired, the print language must be changed first.

Print Character Table

PRINT CHARACTER TABLE prints out a table of the twinax interface current character set.

Character sets are shown in the *6400 Coax/Twinax Programmer's Reference Manual*.

Active Print Language

ACTIVE PRINT LANGUAGE specifies which print language set will be the active set.

• **Standard Print Language** (the default)

• **Alternate Print Language**

Printer Emulation

This parameter defines the printer emulation, as follows:

• **4234-2** (the default)

• **5225**

• **4234-12**

The 4234-12 selection is only present if the IPDS feature is installed. The 4234-12 selection is the default if the IPDS feature is installed, otherwise, the 4234-2 is the default.

After the emulation has been changed, a POR status is sent to the host.

Printer Address

PRINTER ADDRESS allows you to set the device address from 0 through 6. The host directs data and commands on the twinax line to a specific device based on its unique device address.

After the address has been changed, a POR status is sent to the host.

World Trade

The 5225 emulation has a multinational character set that serves as a base for 14 world trade character set assortments. They are shown in the 6400 Coax/Twinax Programmer's Reference Manual.

You can configure the printer to use the Standard Character Set so the printer contains the IBM World Trade character set, such as the Austria/Germany character set. Or, you can select Extended Character Set and use the multinational character set as a base with the selected world trade character set overlaid.

- **Standard Character Set** (the default)

- **Extended Character Set**.

Cancel Buffers

CANCEL BUFFERS has the following options:

- **Enable** (the default). Cancels all buffers when a job is put on hold from the host or the **Cancel** key is pressed.

- **Disable**. Clears the twinax internal buffer, not the print engine buffers, when a job is put on hold from the host or the **Cancel** key is pressed.

Early Print Complete

Early Print Complete allows the printer to send Print Complete status to the host before the printer is actually done printing all data. Early Print Complete is only available if the IPDS feature is installed.

- **Disable** (the default). Means the printer will suppress the Early Print Complete response until all printing is complete.

- **Enable**. Means the printer will send an acknowledgement to the host when it is able to accept more data.

NOTE: When an Early Print Complete is enabled and an error occurs, the data in the printer will remain in the buffer (regardless of the setting of the Cancel Buffer option). It is recommended that local procedures be followed to recover from the error.

Do not select Early Print Complete while a print job is in progress. If this is done you will need to restart the printer.

Hex Transparent Control

This option allows you to enable (the default) or disable additional features that are not available in standard IBM emulations. To access these features, send lead-in character text commands in the data stream. You can also use ASCII codes 80 hex through 9F hex as control codes if configured to do so.

Lead-In Characters

The Lead-In Character commands must have a start and end code. Set 1 is the factory default. Three sets (each containing a start and end code) are available:

- **Set 1**: start code = <% (the default)
      end code = >

- **Set 2**: start code = ¬¬
      end code = $

- **Set 3**: start code = _%
      end code = _

- **User Defined**

User Defined Codes

- **Start Code 2: 5F** (the default)

- **Start Code 1: 5F**

- **Stop code: 5B**

The codes can be set to x'40' - x'FF' range

Alternate Set 80 - 9F

This selection determines if ASCII codes 80 hex through 9F hex will be used as control codes or printed as standard printable characters.

- **Printable** (the default). Prints the alternate set as standard characters

- **Control Code**. Selects the alternate set to be used as printer control codes.

Undefined Character Reporting

UNDEFINED CHARACTER REPORTING allows overriding of the host setting of the SGEA (Set Graphic Error Action) command. For more information about the SGEA command, refer to the *6400 Coax/Twinax Programmer's Reference Manual*.

- **Enable** (the default). The host setting for the SGEA and is used by the printer. If the SGEA command is requested to stop on graphic errors, the printer will stop when a graphic error is detected.

- **Disable**. Ignores the SGEA command from the host. The printer does not stop when an error is detected; instead, it substitutes the character selected in the "UNDEFINED CHARACTER SUBSTITUTION" menu entry.

Undefined Character Substitution

UNDEFINED CHARACTER SUBSTITUTION specifies the replacement character to print in place of any unprintable character that is received from the host. The character becomes the printer default when:

- The printer is powered off and then powered on.

- An SGEA command specifies to use the operator panel default.

- The "UNDEFINED CHARACTER REPORTING" option is disabled.

The character code point can be set to the following values:

- **60** (the default)

- **40 – FE (HEX)**

Load Alternate Character Option

The LOAD ALTERNATE CHARACTER (LAC) OPTION allows the host system to load alternate character images into the printer. This may be used for designing graphics, bar codes, and charts, or for printing in foreign languages.

- **Enable** (the default). Prints the LAC character as defined.

- **Disable**. Ignores the LAC definition from the host and prints from the currently selected character set.

LAC Approximation

A process that reorganizes columns of dots so that clean, readable printing is possible.

- **On** (the default). Converts the emulated character cells to standard cells for the 6400-020, -i2s, and -i24 models.

- **Off**. Converts character cells byte by byte and not by LAC approximation.

Print Text Direction

PRINT TEXT DIRECTION specifies the direction in which characters are printed on the page. This allows the printer to print languages that are printed right to left instead of left to right.

- **Control By Host** (the default)
- **Left To Right**
- **Right To Left**

Override Host

OVERRIDE HOST determines whether the printer executes certain commands sent by the host, or continues to use the current printer settings. The following host commands are ignored when OVERRIDE HOST is enabled: line length, forms length, lines per inch (LPI), characters per inch (CPI), print quality, and text orientation (i.e. left to right). When OVERRIDE HOST is enabled, these settings retain their operator panel settings.

NOTE: Host margin and tab settings will be used whether or not OVERRIDE HOST is enabled.

- **Disable** (the default). Allows certain host commands (line length, forms length, LPI, CPI, print quality, and text orientation) to override operator panel settings. Note that the information appearing on the message display may *not* match the data stream setting. No values will change upon initial selection of the disable option.
- **Enable**. Permits operator panel settings to override host data stream commands.

Format Control

FORMAT CONTROL enables the printer to reflect the same spacing as 6408/6412 Model CT0 printers after absolute and relative move commands are executed. The following options are available:

- **Disable** (the default) does not reflect distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).
- **Enable**. Reflects 6408/6412 Model CT0 distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).

Maximum Printable Width

MAXIMUM PRINTABLE WIDTH sets the maximum width of the printer when using a CT host interface.

- **13.2 Inches** (the default)

- **13.6 Inches**

NOTE: The twinax interface menu and coax interface menu option for maximum printable width use the same internal variable. Setting this option in either menu will make it the current setting for the printer, independent of the interface used.

Although the LP+ emulation maintains width in characters, the maximum printable width in characters is controlled by the same internal variable that is set by the twinax interface menu and coax interface menu option for maximum printable width option.

Hex Print Mode

When enabled, the HEX PRINT MODE parameter prints the EBCDIC data and control codes received from the host as hex values.

- **Disable** (the default)

- **Enable**

Refer to page 274 to obtain a hex code printout.

NOTE: Printing in Hex Mode may alter print attributes set by the host computer. A power cycle may be required after changing HEX PRINT MODE from enable to disable.

C/T Hotport

Gives the printer the ability to handle multiple data streams simultaneously. It allows the printer to serve hosts attached to the serial, parallel, and either coax or twinax ports as if they were the only interface connected.

Port Type

Selects the type of port to be used. The Disable selection disables the port from the hotport process. The available selections are:

- **Twinax** (the default)

- **Coax**

- **Disable**

NOTE: Changing the Port Type in this menu option also changes the Port Type setting in the Coax Interface Menu.

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 the specified period of time, it needs to Timeout to service the other ports. The available selections are:

- **15 Seconds** (the default)

- **10 to 180 Seconds**.

Report Status

- **Disable** (the default). A fault on the printer is reported only if it occurs on the active port.

- **Enable**. The faults are reported even if the fault is not on the current active port.

Coax Interface Menu

Coax Interface[3]
(from page 104)

Print Language	Print Character Table [2]	Active Print Language	PA1[1]	PA2[1]	Buffer Reprint [1]
See the following page.		Standard Print Language* Alternate Print Language	Disable* Enable	Disable* Enable	Disable* Enable

Early Print Complete	SCS Buffer Control	Cancel Buffers	Hex Transparent Control	Mono/Dual Case	Undefined Character Substitution
Disable* Enable	Don't Wait* Wait Until Done	Enable* Disable	Lead-In Characters Set 1 <%>* Set 2 ¬¬$ Set 3 _%_ User Defined User Defined Codes Start Code 1 Start Code 2 Stop Code Alternate Set 80-9F Printable* Control Code	Dual Case* Mono Case	60* 40 - FE (HEX)

Print Text Direction	Image Buffer Size	Intervention Required	Compatibility Options	Translate Table	Override Host
Control By Host* Left to Right Right to Left	4K* 2K	Not Send to Host* Send to Host	See page 135	Default* Downloaded	Disable* Enable

Format Control	C/T Hotport [4]		Maximum Printable Width	Hex Print Mode [2]
Disable* Enable	Port Type Disable* Twinax Coax Timeout 15 Sec* 10 Sec - 180 Sec	Report Status Disable* Enable	13.2 inches* 13.6 inches	Disable* Enable

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter

To select an option, press: ☐

To exit the configuration menus and return to READY, press: Start ☐

* = Factory Default

NOTE:
[1] In Coax mode, the options for PA1, PA2, and Buffer Reprint are displayed only when the coax line is active.
[2] Does not apply to IPDS.
[3] The Twinax and Coax interface menus only appear in the menus if the IBM Coax/Twinax is installed.
[4] Only if Autoswitching is enabled.
[5] Only if Coax Emulation is enabled.

Print Language
(from page 145)

Standard Print Language

Alternate Print Language

Standard	Alternate
0037 English (USA/Canada)*	English US*
0037 English (Netherlands)	English UK/Ireland
0285 English (UK/Ireland)	Austrian/German
0273 Austrian/German	Austrian/German (Alternate)
0274 Belgian Old	Belgian
0275 Brazilian	Brazilian
0260 Canadian French	Canadian French
0277 Danish/Norwegian	Danish/Norwegian
0287 Danish/Norwegian (Alternate)	Danish/Norwegian (Alternate)
0278 Finnish/Swedish	Finnish/Swedish
0288 Finnish/Swedish (Alternate)	Finnish/Swedish (Alternate)
0297 French/French Azerty	French
0500 International Set 5	International
0280 Italian	Italian
0281 Japanese English	Japanese English
0282 Portuguese	Japanese Katakana
0284 Spanish/Spanish Speaking	Portuguese
0289 Spanish (Alternate)	Portuguese (Alternate)
0500 Swiss Bilingual	Spanish
0500 Belgian New	Spanish (Alternate)
0803 Hebrew Old (089)	Spanish Speaking
0424 Hebrew	Swiss Bilingual
0892 ORC A	
0893 ORC B	
0420 Arabic	
0880 Cyrillic Old	
0423 Greek Old	
0875 Greek New Euro	
0871 Icelandic	
0290 Japanese Katakana	
0870 Latin 2/Roece/Multilingual	
0838 Thai	
1026 Turkish	
0890 Yugoslav Old	
1097 Farsi	
1025 Cyrillic Multilingual	
0905 Turkish Old	
0256 International Set 1	
0924 Euro Latin 9	
1140 Euro English (USA/Canada)	
1141 Euro Austrian/German	
1142 Euro Danish/Norwegian	
1143 Euro Finnish/Swedish	
1144 Euro Italian	
1145 Euro Spanish Speaking	
1146 Euro English (UK/Ireland)	
1147 Euro French (Azerty 105)	
1148 Euro Swiss Bilingual	
1149 Euro Icelandic	
OCR-B Katakana	

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

Print Language

PRINT LANGUAGE specifies the set of print languages used by the printer. Refer to the previous page for print language menus.

- **Standard Print Language** (the default)

- **Alternate Print Language**. Provides code pages compatible with 6408/ 6412 Model CT0 printers. Use this option with the 3287 printer emulation.

Specifying a print *quality* of OCR A or OCR B will change the print *language* to OCR A or OCR B.

When OCR A or OCR B is selected as the default print language, OCR A and OCR B are the only available values for this parameter. If a different print quality value is desired, the print language must be changed first.

Print Character Table

PRINT CHARACTER TABLE prints out a table of the coax interface current character set.

All coax character sets are shown in the *6400 Coax/Twinax Programmer's Reference Manual*.

Active Print Language

ACTIVE PRINT LANGUAGE specifies which print language set will be the active set.

- **Standard Print Language** (the default)

- **Alternate Print Language**

PA1

PA1 is only valid when the printer is in the NOT READY state and the coax System Network Architecture Character Set (SCS) data stream is active. This function displays the "PA1 ENABLED" message when the **Enter** key is pressed and sends a special operator request to the host when the printer is made READY.

- **Disable** (the default)

- **Enable**

Refer to the *6400 Coax/Twinax Programmer's Reference Manual* for more information about SCS.

NOTE: Selecting the PA1 menu item again ("PA1 DISABLED" appears on the operator panel) or selecting the PA2 menu item will reset the pending PA1 function.

PA2

PA2 is only valid when the printer is in the NOT READY state and the coax SCS data stream is active. This function displays the "PA2 ENABLED" message when the **Enter** key is pressed and sends a special operator request to the host when the printer is made READY.

• **Disable** (the default)

• **Enable**

NOTE: Selecting the PA2 menu item again ("PA2 DISABLED" appears on the operator panel) or selecting the PA1 menu item will reset the pending PA2 function.

Buffer Reprint

This option is only valid when the printer is in the NOT READY state and the Coax SCS data stream is active. The printer displays the "ENABLED" message when the **Enter** key is pressed, and sends an Intervention Required Status to the host when the printer goes to READY state.

• **Disable** (the default)

• **Enable**

NOTE: Selecting the Buffer Reprint menu item again ("DISABLED" appears on the operator panel) will reset the Buffer Reprint function.

Early Print Complete

Early Print Complete capability allows the printer to send Print Complete status to the host before the printer is actually done printing all data.

• **Disable** (the default). The printer will suppress the Early Print Complete response until all printing is complete.

• **Enable**. The printer will send an acknowledgement to the host when it is able to accept more data.

NOTE: When an Early Print Complete is enabled and an error occurs, the data in the printer will remain in the buffer (regardless of the setting of the Cancel Buffer option). It is recommended that local procedures be followed to recover from the error.

Do not select Early Print Complete while a print job is in progress. If this is done you will need to restart the printer.

SCS Buffer Control

This option is used in Coax LU1/SCS mode only.

- **Don't Wait** (the default).The printer does not wait for the job to be printed before sending the print completion to the host.

- **Wait Until Done**. The printer waits for the job to print before sending the print completion to the host.

This option speeds up the LU1 job printing for short jobs. If you select "Don't Wait," there is a risk that you may not be able to recover the print job when the printer has fault.

Cancel Buffers

CANCEL BUFFERS has the following options:

- **Enable** (the default). cancels all buffers when a job is put on hold from the host or when the **Cancel** key is pressed.

- **Disable**. Clears the coax internal buffer, not the print engine buffers, when a job is put on hold from the host or when the **Cancel** key is pressed.

Hex Transparent Control

You can enable additional features that are not available in standard IBM emulations. To access these features, send lead-in character text commands in the data stream. You can also use ASCII codes 80 hex through 9F hex as control codes if configured to do so.

Lead-In Characters

The Lead-In Character commands must have a start and end code. Set 1 is the factory default. Three sets (each containing a start and end code) are available:

- **Set 1**: start code = <%
  end code = >

- **Set 2**: start code = ¬¬
  end code = $

- **Set 3**: start code = _%
  end code = _

- **User Defined**

User Defined Codes

- **Start Code 2**: 5F* (the default)

- **Start Code 1**: 5F

- **Stop Code**: 5B

The codes can be set to x'40' - x'FF' range

Alternate Set 80 - 9F

This selection determines if ASCII codes 80 hex through 9F hex will be used as control codes or printed as standard printable characters.

- **Printable** (the default). Prints the alternate set as standard characters

- **Control Code**. Selects the alternate set to be used as printer control codes.

Mono/Dual Case

MONO/DUAL CASE specifies the font as MONO Case or DUAL Case (the default). It is available only in non–SCS mode. The host will be notified of the change when the printer is made READY. If the character set is one of the following 'right to left' sets, MONO CASE prints the same as DUAL CASE: Katakana, Hebrew, Hebrew Old, and Farsi.

- **Dual Case** (the default)
- **Mono Case**

SCS (System Network Architecture Character String) Mode is controlled by the host computer. Refer to the *6400 Coax/Twinax Programmer's Reference Manual* for more information about non–SCS mode.

Undefined Character Substitution

UNDEFINED CHARACTER SUBSTITUTION specifies the replacement character to print in place of any unprintable character that is received from the host. The character code point can have the following value:

- **60 Hex** (the default)
- **40 – FE Hex**

Print Text Direction

PRINT TEXT DIRECTION specifies the direction in which characters are printed on the page. This allows the printer to print languages which are printed right to left instead of left to right.

- **Control By Host** (the default)
- **Left To Right**
- **Right To Left**

The "CONTROL BY HOST" option allows printers configured as a 4234 to use the "SET TEXT ORIENTATION" command from the host.

When a RIGHT TO LEFT language is selected, the host will be notified of print direction changes when the printer is made READY.

Image Buffer Size

IMAGE BUFFER SIZE (screen buffer size) allows you to select the following image buffer sizes:

• **4K** (the default)

• **2K**

A POR status is sent to the host when the printer is made READY.

Intervention Required

Select from the following:

• **Not Send To Host** (the default)

• **Send To Host**. The printer sends a signal to the host computer when any of the following occur:

    • Printer faults occur.

    • Hold mode time–out occurs.

If not selected, the printer will only send the signal on printer faults that cause data loss (paper jam, ribbon stall, online platen open, etc.).

Compatibility Options

See page 135.

Translate Table

This parameter defines which translate table to use for printing. The following options are available:

• **Default** (the default). Translates data by using the default table of the current character set.

• **Downloaded**. Translates data from EBCDIC to internal code by using the downloaded translate table.

Override Host

OVERRIDE HOST determines whether the printer executes certain commands sent by the host, or continues to use the current settings. The following host commands are ignored when OVERRIDE HOST is enabled: line length, forms length, lines per inch (LPI), characters per inch (CPI), print quality, and text orientation (i.e. left to right). When OVERRIDE HOST is enabled, these settings retain their operator panel settings.

• **Disable** (the default). Allows certain host commands (line length, forms length, LPI, CPI, print quality, and text orientation) to override operator panel settings. Note that the information appearing on the message display may *not* match the data stream setting. No values will change upon initial selection of the disable option.

• **Enable**. Permits operator panel settings to override host data stream commands.

Format Control

FORMAT CONTROL enables the printer to reflect the same spacing as 6408/6412 Model CT0 printers after absolute and relative move commands are executed. The following options are available:

- **Disable** (the default). Does not reflect distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).

- **Enable**. Reflects 6408/6412 Model CT0 distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).

C/T Hotport

Gives the printer the ability to handle multiple data streams simultaneously. It allows the printer to serve hosts attached to the serial, parallel, and either coax or twinax ports as if they were the only interface connected.

Port Type

Selects the type of port to be used. The Disable selection disables the port from the hotport process. The available selections are:

- **Twinax** (the default)

- **Coax**

- **Disable**

NOTE: Changing the Port Type in this menu option also changes the Port Type setting in the Twinax Interface Menu.

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 the specified period of time, it needs to Timeout to service the other ports. The available selections are:

- **15 Seconds** (the default)

- **10 to 180 Seconds**.

Report Status

- **Disable** (the default). A fault on the printer is reported only if it occurs on the active port.

- **Enable**. The faults are reported even if the fault is not on the current active port.

Maximum Printable Width

MAXIMUM PRINTABLE WIDTH sets the maximum width of the printer when using a CT host interface.

• **13.2 Inches** (the default)

• **13.6 Inches**

NOTE: The twinax interface menu and coax interface menu option for maximum printable width use the same internal variable. Setting this option in either menu will make it the current setting for the printer, independent of the interface used.

Although the LP+ emulation maintains width in characters, the maximum printable width in characters is controlled by the same internal variable that is set by the twinax interface menu and coax interface menu option for maximum printable width option.

Hex Print Mode

When enabled, the HEX PRINT MODE parameter prints the EBCDIC data and control codes received from the host as hex values. Refer to page to obtain a hex code printout. Disable is the default condition.

• **Disable** (the default)

• **Enable**

NOTE: Printing in Hex Mode may alter print attributes set by the host computer. A power cycle may be required after changing HEX PRINT MODE from enable to disable.

Compatibility Options Menu

The Compatibility Options menu allows you to select special printer functions in the non–SCS mode, based on the capabilities of the printer emulated.

```
┌─────────────────┐
│ Compatibility   │
│    Options       │
│ (from page 126) │
└─────────────────┘
```

(4234 only)

Compatibility Option 1	Compatibility Option 2	Compatibility Option 3	Compatibility Option 4	Compatibility Option 5
On* Off	On* Off	Off* On	On* Off	Off* On

(3287 only)   (SCS data stream only)

Compatibility Option 6	Compatibility Option 7	Compatibility Option 8	Compatibility Option 9	Compatibility Option 10
Off* On	Off* On	Off* On	On* Off	Off* On

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus and return to READY, press:

Start

Compatibility Option 1:
Carriage Return at MPP+1

MPP is Maximum Print Position, which is also known as line length. OPTION 1 controls a carriage return at the end of a print line and at MPP+1.

- **ON** (the default). Produces a carriage return to the first print position of the next line.

- **OFF**. Produces a carriage return to the first print position of the current line.

Compatibility Option 2:
New Line at MPP+1

NEW LINE AT MPP+1 controls how many lines are skipped when the carriage returns to a new line.

- **ON** (the default). Moves to the first print position two lines down from the current position.

- **OFF** Moves to the first print position of the next print line.

Compatibility Option 3:
Position After Form Feed (4234 only)

POSITION AFTER FORM FEED allows you to select the location of the print position after a form feed command is sent.

- **OFF** (the default). Sets the printer to print at position 2 of the first print line on the next form.

- **ON**. Sets the printer to print at print position 1 of the first print line on the next form.

Compatibility Option 4:
Form Feed at End of Print Buffer

FORM FEED AT END OF PRINT BUFFER determines the print line position when a form feed command is the last code encountered in the print buffer.

- **ON** (the default). Moves to the first print position on the second line of the next form.

- **OFF**. Moves to the first print position on the first line of the next form.

NOTE: This option is ignored if Compatibility Option 7 is on.

If configured as a 3287, and a form feed occurs in the middle of a print buffer, the printer defaults to the first print position on the second line of the next form, regardless of the setting of this option.

Compatibility Option 5:
Null Suppression

NULL SUPPRESSION will either treat nulls as blank spaces or ignore them. If nulls are ignored, the print position does not move.

- **OFF** (the default). Ignores nulls.

- **ON**. Treats nulls as blank spaces.

Compatibility Option 6:
Form Feed Command Position

FORM FEED COMMAND POSITION determines if the position of a form feed command affects its execution.

- **OFF** (the default). Performs a form feed only if it occurs at the first print position in a line or at Maximum Print Position +1. (The Maximum Print Position is the line length.) A form feed command at any other position is recognized as a blank.

- **ON**. Allows the printer to perform a form feed command anywhere in the data stream.

Compatibility Option 7:
Automatic Form Feed at End of Print Buffer

AUTOMATIC FORM FEED AT END OF PRINT BUFFER specifies whether or not to perform an automatic form feed at the end of a print buffer.

- **OFF** (the default). Performs an automatic new line command after completing a print buffer (unless a form feed, new line, or carriage return command was the last one executed). The printer is set to print at print position 1 of the next line.

- **ON**. Performs an automatic form feed after completing a print buffer (unless a form feed command was the last one in the buffer). The printer is set to print at print position 1 of the first line of the next form.

Compatibility Option 8:
Automatic FF After Operator–Initiated Copy

This option determines the print position after an operator–initiated local copy (print screen function).

- **OFF** (the default). Performs an automatic new line command after completing a print buffer (unless a new line, form feed or carriage return command was the last one executed). The printer is set to print at print position 1 of the next line.

- **ON**. Performs an automatic form feed command unless a form feed was the last one executed. The printer is set to print at print position 1 of the first line on the next form.

Compatibility Option 9:
CR, EM, and NL (3287 only)

CR (Carriage Return), EM (Error Message), and NL (New Line) specify that
the printer treat the CR, EM, and NL control codes either as spaces or as
control codes.

- **ON** (the default). Treats the CR, EM and NL commands as control codes.

- **OFF**. Treats the CR, EM and NL commands as spaces.

Compatibility Option 10:
Bottom Margin (SCS data stream only)

Any bottom margin specified or implied by a host command will be
overridden, causing the operator panel bottom margin value to be used

- **OFF** (the default). Ignores the operator panel bottom margin value.

- **ON**. Forces the bottom margin to the value specified by the operator
  panel.

NOTE: If Bottom Margin is ON, the operator can enter a bottom margin; the
top margin will be forced to zero. If it is OFF, the operator panel
bottom margin is forced to zero.

5250 Interface Menu

```
┌─────────────────┐
│   5250          │
│ Interface (1)   │
│ (from page 104) │
└─────────────────┘
```

Print Language	Print Character Table	Active Print Language	Hex Transparent Control	Undefined Character Reporting

See the following page.

Standard Print Language*
Alternate Print Language

Lead-In Characters
  Set 1 <%>*
  Set 2 ¬¬$
  Set 3 _%_
  User Defined
User Defined Codes
  Start Code 1
    5F*
    40-FF
  Start Code 2
    5F*
    40-FF
  Stop Code
    5B*
    40-FF
Alternate Set 80-9F
  Printable*
  Control Code

Enable*
Disable

Undefined Character Substitution	Print Text Direction	Override Host	Format Control	Maximum Print Width

60*
40-FE (HEX)

Left To Right*
Right To Left

Disable*
Enable

Disable*
Enable

13.2 inches*
13.6 Inches

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

NOTE:
[1] This menu appears only if the TN5250/3270 option is installed.

* = Factory Default

Print Language
(from page 139)

Standard Print Language

Alternate Print Language

0037 English (USA/Canada)*
0037 English (Netherlands)
0500 Swiss Bilingual
0500 Belgian New
0273 Austrian/German
0274 Belgian Old
0275 Brazilian
0260 Canadian French
0277 Danish/Norwegian
0278 Finnish/Swedish
0297 French/French Azerty
0280 Italian
0281 Japanese English
0282 Portuguese
0284 Spanish/Spanish Speaking
0285 English (UK/Ireland)
0892 ORC A
0893 ORC B
0424 Hebrew
0803 Hebrew Old (089)
0420 Arabic
0880 Cyrillic Old
0423 Greek Old
0875 Greek New Euro
0871 Icelandic
0290 Japanese Katakana
0870 Latin 2/Roece/Multilingual
0838 Thai
1026 Turkish
0890 Yugoslav Old
1097 Farsi
1025 Cyrillic Multilingual
0256 International Set 1
1112 Baltic Multilingual
0924 Euro Latin 9
1122 Estonian
1140 Euro English (USA/Canada)
1141 Euro Austrian/German
1142 Euro Danish/Norwegian
1143 Euro Finnish/Swedish
1144 Euro Italian
1145 Euro Spanish Speaking
1146 Euro English (UK/Ireland)
1147 Euro French (Azerty 105)
1148 Euro Swiss Bilingual
1149 Euro Icelandic
OCR-B Katakana
0500 International Set 5

English US*
Austrian/German
Belgian
Brazilian
Canadian French
Danish/Norwegian
Finnish/Swedish
French
Italian
Japanese English
Japanese Katakana
Portuguese
Spanish
Spanish Speaking
English UK/Ireland
Multinational

Print Language

PRINT LANGUAGE specifies the set of print languages used by the printer. Refer to the previous page for print language menus.

• **Standard Print Language** (the default)

• **Alternate Print Language**. Provides code pages compatible with 6408/ 6412 Model CT0 printers.

Specifying a print *quality* of OCR A or OCR B will change the print *language* to OCR A or OCR B.

When OCR A or OCR B is selected as the default print language, OCR A and OCR B are the only available values for this print quality. If a different print quality value is desired, the print language must be changed first.

Print Character Table

PRINT CHARACTER TABLE prints out a table of the 5250 interface current character set.

Character sets are shown in the *6400 Coax/Twinax Programmer's Reference Manual*.

Active Print Language

Selects which group of print language sets (Standard or Alternate) will be active.

• **Standard Print Language** (the default)

• **Alternate Print Language**

Hex Transparent Control

This option allows you to enable (the default) or disable additional features that are not available in standard IBM emulations. To access these features, send lead-in character text commands in the data stream. You can also use ASCII codes 80 hex through 9F hex as control codes if configured to do so.

Lead-In Characters

The Lead-In Character commands must have a start and end code. Set 1 is the factory default. Three sets (each containing a start and end code) are available:

- **Set 1**: start code = <% (the default)
  end code = >

- **Set 2**: start code = ¬¬
  end code = $

- **Set 3**: start code = _%
  end code = _

- **User Defined**

User Defined Codes

- **Start Code 2: 5F** (the default)

- **Start Code 1: 5F** (the default)

- **Stop Code: 5B** (the default)

The codes have a range of x'40' - x'FF'.

Alternate Set 80 - 9F

This selection determines if ASCII codes 80 hex through 9F hex will be used as control codes or printed as standard printable characters.

- **Printable** (the default). Prints the alternate set as standard characters

- **Control Code**. Selects the alternate set to be used as printer control codes.

Undefined Character Reporting

UNDEFINED CHARACTER REPORTING allows overriding of the host setting of the SGEA (Set Graphic Error Action) command. For more information about the SGEA command, refer to the *6400 Coax/Twinax Programmer's Reference Manual*.

- **Enable** (the default). The host setting for the SGEA and is used by the printer. If the SGEA command is requested to stop on graphic errors, the printer will stop when a graphic error is detected.

- **Disable**. Ignores the SGEA command from the host. The printer does not stop when an error is detected; instead, it substitutes the character selected in the "UNDEFINED CHARACTER SUBSTITUTION" menu entry.

Undefined Character Substitution

UNDEFINED CHARACTER SUBSTITUTION specifies the replacement character to print in place of any unprintable character that is received from the host. The character becomes the printer default when:

- The printer is powered off and then powered on.
- An SGEA command specifies to use the operator panel default.
- The "UNDEFINED CHARACTER REPORTING" option is disabled.

The character code point can be set to the following values:

- **60** (the default)
- **40 – FE (HEX)**

Print Text Direction

Specifies the direction in which text is printed on the page. This allows the printer to print languages which are printed right to left instead of left to right.

- **Left to Right** (the default)
- **Right to Left**. When a right to left language is selected, the host will be notified of print direction changes when the printer is put online.

Override Host

Determines whether the printer executes certain commands sent by the host, or continues to use the current printer settings. The following host commands are ignored when OVERRIDE HOST is enabled: line length, forms length, lines per inch (LPI), characters per inch (CPI), print quality, and text orientation (i.e. left to right). When OVERRIDE HOST is enabled, these settings retain their operator panel settings.

NOTE: Host margin and tab settings will be used whether or not OVERRIDE HOST is enabled.

- **Disable** (the default). Allows certain host commands (line length, forms length, LPI, CPI, print quality, and text orientation) to override operator panel settings. Note that the information appearing on the message display may *not* match the data stream setting. No values will change upon initial selection of the disable option.
- **Enable**. Permits operator panel settings to override host data stream commands.

Format Control

Enables the printer to reflect the same spacing as 6408/6412 Model CT0 printers after absolute and relative move commands are executed. The following options are available:

- **Disable** (the default) does not reflect distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).

- **Enable**. Reflects 6408/6412 Model CT0 distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).

Maximum Print Width

Sets the maximum width of the printer when using a CT host interface.

- **13.2 Inches** (the default)

- **13.6 Inches**

NOTE: The 5250 interface menu and 3270 interface menu option for maximum printable width use the same internal variable. Setting this option in either menu will make it the current setting for the printer, independent of the interface used.

Although the LP+ emulation maintains width in characters, the maximum printable width in characters is controlled by the same internal variable that is set by the 5250 interface menu and 3270 interface menu option for maximum printable width option.

3270 Interface Menu

3270 Interface [1]
(from page 104)

Print Language	Print Character Table	Active Print Language	Early Print Complete	Hex Transparent Control

See the following page.

Standard Print Language*
Alternate Print Language

Disable*
Enable

Lead-In Characters
  Set 1 <%>*
  Set 2 ¬¬$
  Set 3 _%_
  User Defined
User Defined Codes
  Start Code 1
    5F*
    40-FF
  Start Code 2
    5F*
    40-FF
  Stop Code
    5B*
    40-FF
Alternate Set 80-9F
  Printable*
  Control Code

Mono/Dual Case	Undefined Character Substitution	Print Text Direction	Intervention Required	Compatibility Options	Override Host

Dual Case*
Mono Case

60*
40-FE (HEX)

Left To Right*
Right To Left

Not Send to Host*
Send to Host

See page 151

Disable*
Enable

Format Control	Maximum Printable Width

Disable*
Enable

13.2 inches*
13.6 inches

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

NOTE:
[1] This menu appears only if the TN5250/3270 option is installed.

145

```
┌─────────────────────┐
│ Print Language      │
│ (from page 145)     │
└─────────────────────┘
```

* = Factory Default

```
┌─────────────────────┐         ┌─────────────────────┐
│ Standard Print      │         │ Alternate Print     │
│ Language            │─────────│ Language            │
└─────────────────────┘         └─────────────────────┘
```

Standard Print Language	Alternate Print Language
0037 English (USA/Canada)*	English US*
0037 English (Netherlands)	English UK/Ireland
0285 English (UK/Ireland)	Austrian/German
0273 Austrian/German	Austrian/German (Alternate)
0274 Belgian Old	Belgian
0275 Brazilian	Brazilian
0260 Canadian French	Canadian French
0277 Danish/Norwegian	Danish/Norwegian
0287 Danish/Norwegian (Alternate)	Danish/Norwegian (Alternate)
0278 Finnish/Swedish	Finnish/Swedish
0288 Finnish/Swedish (Alternate)	Finnish/Swedish (Alternate)
0297 French/French Azerty	French
0500 International Set 5	International
0280 Italian	Italian
0281 Japanese English	Japanese English
0282 Portuguese	Japanese Katakana
0284 Spanish/Spanish Speaking	Portuguese
0289 Spanish (Alternate)	Portuguese (Alternate)
0500 Swiss Bilingual	Spanish
0500 Belgian New	Spanish (Alternate)
0803 Hebrew Old (089)	Spanish Speaking
0424 Hebrew	Swiss Bilingual
0892 ORC A	
0893 ORC B	
0420 Arabic	
0880 Cyrillic Old	
0423 Greek Old	
0875 Greek New Euro	
0871 Icelandic	
0290 Japanese Katakana	
0870 Latin 2/Roece/Multilingual	
0838 Thai	
1026 Turkish	
0890 Yugoslav Old	
1097 Farsi	
1025 Cyrillic Multilingual	
0905 Turkish Old	
0256 International Set 1	
0924 Euro Latin 9	
1140 Euro English (USA/Canada)	
1141 Euro Austrian/German	
1142 Euro Danish/Norwegian	
1143 Euro Finnish/Swedish	
1144 Euro Italian	
1145 Euro Spanish Speaking	
1146 Euro English (UK/Ireland)	
1147 Euro French (Azerty 105)	
1148 Euro Swiss Bilingual	
1149 Euro Icelandic	
OCR-B Katakana	

Print Language

PRINT LANGUAGE specifies the set of print languages used by the printer. Refer to the previous page for print language menus.

Specifying a print *quality* of OCR A or OCR B will change the print *language* to OCR A or OCR B.

When OCR A or OCR B is selected as the default print language, OCR A and OCR B are the only available values for this print quality. If a different print quality value is desired, the print language must be changed first.

Print Character Table

PRINT CHARACTER TABLE prints out a table of the 3270 interface current character set.

Character sets are shown in the *6400 Coax/Twinax Programmer's Reference Manual*.

Active Print Language

Selects which group of print language sets (Standard or Alternate) will be active.

- **Standard Print Language** (the default)
- **Alternate Print Language**

Early Print Complete

Allows the printer to indicate to the host that print has completed before it actually occurs. This can improve throughput in certain modes.

- **Disable** (the default). The printer will not respond until printing is complete.
- **Enable**. The printer will indicate to the host that it is able to accept more data before printing is complete.

NOTE: Early Print Complete should only be enabled to improve performance when running DSC (LU0) or DSE (LU3). This does not apply in SNA (LU1) mode. Interventions such as form jams and end of forms will not be sent to the host when Early Print Complete is enabled.

Hex Transparent Control

You can enable additional features that are not available in standard IBM emulations. To access these features, send lead-in character text commands in the data stream. You can also use ASCII codes 80 hex through 9F hex as control codes if configured to do so.

Lead-In Characters

The Lead-In Character commands must have a start and end code. Set 1 is the factory default. Three sets (each containing a start and end code) are available:

- **Set 1**: start code = <%
            end code = >

- **Set 2**: start code = ¬¬
            end code = $

- **Set 3**: start code = _%
            end code = _

- **User Defined**

User Defined Codes

- **Start Code 2: 5F** (the default)

- **Start Code 1: 5F** (the default)

- **Stop Code: 5B** (the default)

The codes have a range of x'40' - x'FF'.

Alternate Set 80 - 9F

This selection determines if ASCII codes 80 hex through 9F hex will be used as control codes or printed as standard printable characters.

- **Printable** (the default). Prints the alternate set as standard characters

- **Control Code**. Selects the alternate set to be used as printer control codes.

Mono/Dual Case

Specifies the font as Mono or Dual case. This option is available only in non-SCS mode. The host will be notified of the change when the printer is placed online. Mono Case prints the same as Dual Case if the character set is one of the following "right to left" sets: Katak., Hebrew, Old Hebrew, and Farsi.

SCS (System Network Architecture Character String) mode is controlled by the host computer.

- **Dual Case** (the default)
- **Mono Case**

Undefined Character Substitution

UNDEFINED CHARACTER SUBSTITUTION specifies the replacement character to print in place of any unprintable character that is received from the host. The character becomes the printer default when:

*   The printer is powered off and then powered on.

*   An SGEA command specifies to use the operator panel default.

*   The "UNDEFINED CHARACTER REPORTING" option is disabled.

The character code point can be set to the following values:

*   **60** (the default)

*   **40 – FE (HEX)**

Print Text Direction

Specifies the direction in which characters are printed on the page. This allows the printer to print languages which are printed right to left instead of left to right.

*   **Left to Right** (the default).

*   **Right to Left**. When a right to left language is selected, the host will be notified of print direction changes when the printer is put online.

Intervention Required

Select from the following:

*   **Not Send To Host** (the default)

*   **Send To Host**. The printer sends a signal to the host computer when any of the following occur:

    *   Printer faults occur.

    *   Hold mode time–out occurs.

If not selected, the printer will only send the signal on printer faults that cause data loss (paper jam, ribbon stall, online platen open, etc.).

Override Host

Determines whether the printer executes certain commands sent by the host, or continues to use the current settings. The following host commands are ignored when OVERRIDE HOST is enabled: line length, forms length, lines per inch (LPI), characters per inch (CPI), print quality, and text orientation (i.e. left to right). When OVERRIDE HOST is enabled, these settings retain their operator panel settings.

- **Disable** (the default). Allows certain host commands (line length, forms length, LPI, CPI, print quality, and text orientation) to override operator panel settings. Note that the information appearing on the message display may *not* match the data stream setting. No values will change upon initial selection of the disable option.

- **Enable**. Permits operator panel settings to override host data stream commands.

Format Control

Enables the printer to reflect the same spacing as 6408/6412 Model CT0 printers after absolute and relative move commands are executed. The following options are available:

- **Disable** (the default). Does not reflect distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).

- **Enable**. Reflects 6408/6412 Model CT0 distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).

Maximum Printable Width

Sets the maximum width of the printer when using a CT host interface.

- **13.2 Inches** (the default)

- **13.6 Inches**

NOTE: The 5250 interface menu and 3270 interface menu option for maximum printable width use the same internal variable. Setting this option in either menu will make it the current setting for the printer, independent of the interface used.

Although the LP+ emulation maintains width in characters, the maximum printable width in characters is controlled by the same internal variable that is set by the 5250 interface menu and 3270 interface menu option for maximum printable width option.

Compatibility Options Menu
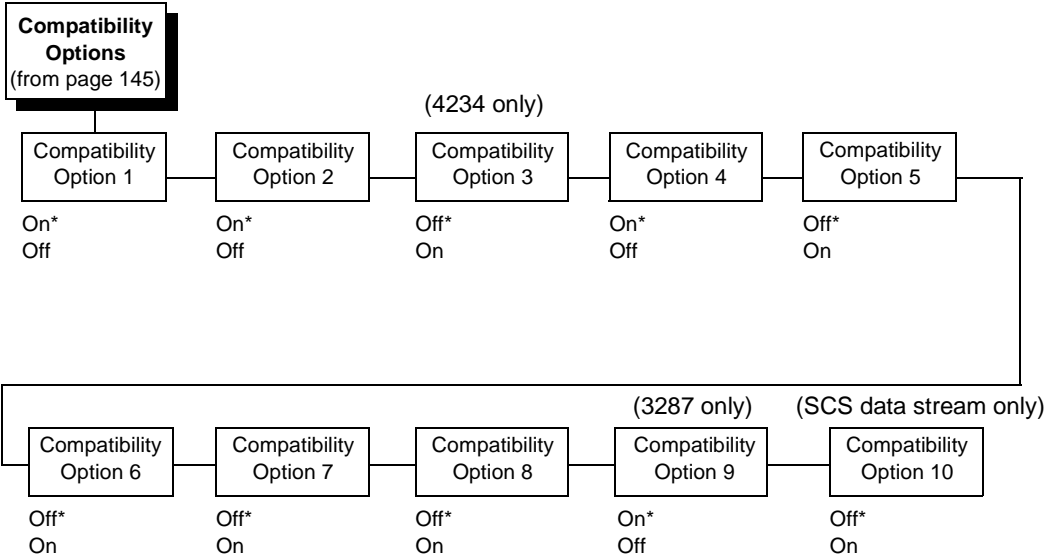
```
┌──────────────────┐
│  Compatibility   │
│     Options      │
│ (from page 145)  │
└──────────────────┘
```

                                    (4234 only)

Compatibility Option 1	Compatibility Option 2	Compatibility Option 3	Compatibility Option 4	Compatibility Option 5
On*	On*	Off*	On*	Off*
Off	Off	On	Off	On

                                              (3287 only)   (SCS data stream only)

Compatibility Option 6	Compatibility Option 7	Compatibility Option 8	Compatibility Option 9	Compatibility Option 10
Off*	Off*	Off*	On*	Off*
On	On	On	Off	On

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

                                           Enter
To select an option, press:

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

Compatibility Options

Compatibility Option 1:
Carriage Return at MPP+1

MPP is Maximum Print Position, which is also known as line length. OPTION 1 controls a carriage return at the end of a print line and at MPP+1.

- **ON** (the default). Produces a carriage return to the first print position of the next line.

- **OFF**. Produces a carriage return to the first print position of the current line.

Compatibility Option 2:
New Line at MPP+1

NEW LINE AT MPP+1 controls how many lines are skipped when the carriage returns to a new line.

- **ON** (the default). Moves to the first print position two lines down from the current position.

- **OFF**. Moves to the first print position of the next print line.

Compatibility Option 3:
Position After Form Feed (4234 only)

POSITION AFTER FORM FEED allows you to select the location of the print position after a form feed command is sent.

- **OFF** (the default). Sets the printer to print at position 2 of the first print line on the next form.

- **ON**. Sets the printer to print at print position 1 of the first print line on the next form.

Compatibility Option 4:
Form Feed at End of Print Buffer

FORM FEED AT END OF PRINT BUFFER determines the print line position when a form feed command is the last code encountered in the print buffer.

- **ON** (the default). Moves to the first print position on the second line of the next form.

- **OFF**. Moves to the first print position on the first line of the next form.

NOTE: This option is ignored if Compatibility Option 7 is on.

If configured as a 3287, and a form feed occurs in the middle of a print buffer, the printer defaults to the first print position on the second line of the next form, regardless of the setting of this option.

Compatibility Option 5:
Null Suppression

NULL SUPPRESSION will either treat nulls as blank spaces or ignore them. If nulls are ignored, the print position does not move.

- **OFF** (the default). Ignores nulls.

- **ON**. Treats nulls as blank spaces.

Compatibility Option 6:
Form Feed Command Position

FORM FEED COMMAND POSITION determines if the position of a form feed command affects its execution.

- **OFF** (the default). Performs a form feed only if it occurs at the first print position in a line or at Maximum Print Position +1. (The Maximum Print Position is the line length.) A form feed command at any other position is recognized as a blank.

- **ON**. Allows the printer to perform a form feed command anywhere in the data stream.

Compatibility Option 7:
Automatic Form Feed at End of Print Buffer

AUTOMATIC FORM FEED AT END OF PRINT BUFFER specifies whether or not to perform an automatic form feed at the end of a print buffer.

- **OFF** (the default). Performs an automatic new line command after completing a print buffer (unless a form feed, new line, or carriage return command was the last one executed). The printer is set to print at print position 1 of the next line.

- **ON**. Performs an automatic form feed after completing a print buffer (unless a form feed command was the last one in the buffer). The printer is set to print at print position 1 of the first line of the next form.

Compatibility Option 8:
Automatic FF After Operator–Initiated Copy

This option determines the print position after an operator–initiated local copy (print screen function).

- **OFF** (the default). Performs an automatic new line command after completing a print buffer (unless a new line, form feed or carriage return command was the last one executed). The printer is set to print at print position 1 of the next line.

- **ON**. Performs an automatic form feed command unless a form feed was the last one executed. The printer is set to print at print position 1 of the first line on the next form.

Compatibility Option 9:
CR, EM, and NL (3287 only)

CR (Carriage Return), EM (Error Message), and NL (New Line) specify that
the printer treat the CR, EM, and NL control codes either as spaces or as
control codes.

- **ON** (the default). Treats the CR, EM and NL commands as control codes.

- **OFF**. Treats the CR, EM and NL commands as spaces.

Compatibility Option 10:
Bottom Margin (SCS data stream only)

Any bottom margin specified or implied by a host command will be
overridden, causing the operator panel bottom margin value to be used

- **OFF** (the default). Ignores the operator panel bottom margin value.

- **ON**. Forces the bottom margin to the value specified by the operator
  panel.

NOTE: If Bottom Margin is ON, the operator can enter a bottom margin; the
top margin will be forced to zero. If it is OFF, the operator panel
bottom margin is forced to zero.

Network Setup Menu

```
┌─────────────┐
│   Network   │
│    Setup    │
│(from page 107)│
└─────────────┘
      │
```

Adapter Address [1]	Adapter Parameters [1]	Ethernet Address [2]	Ethernet Parameters [2]	Wireless Address [3]	Wireless Parameters [3]
See page 155.	See page 157.	See page 161.	See page 162.	See page 165.	See page 166.
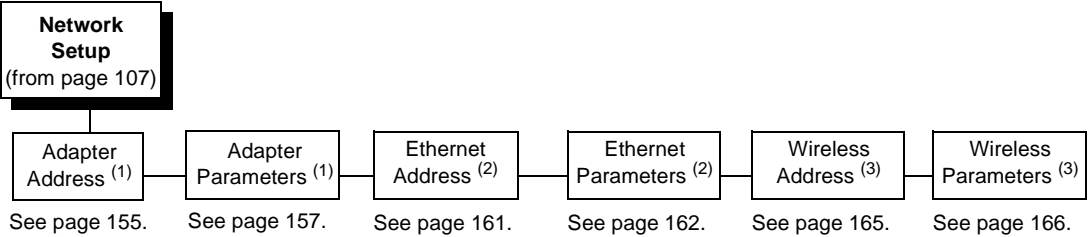
NOTE:

[1] Only if the Ethernet Adapter feature is installed.
[2] Only if the Integrated Ethernet feature is installed.
[3] Only if the Wireless adapter feature is installed.

To view options, press:

Scroll↑   Scroll↓   **Enter**   Return

To select an option, press: **Enter**

To exit the configuration menus and return to READY, press: Start

* = Factory Default

Adapter Address Submenu

```
┌─────────────┐
│   Adapter   │
│   Address   │
│(from page 155)│
└─────────────┘
      │
```

* = Factory Default

IP ADDRESS	SUBNET MASK	GATEWAY ADDRESS	MAC ADDRESS	DHCP
XXX.XXX.XXX.XXX	XXX.XXX.XXX.XXX	XXX.XXX.XXX.XXX	hhhhhhhhhhhh	Disable* Enable

To view options, press:

Scroll↑   Scroll↓   **Enter**   Return

To select an option, press: **Enter**

To exit the configuration menus and return to READY, press: Start

* = Factory Default

IP ADDRESS

A numeric address such as 123.45.61.23 which identifies a printer or server in a LAN or WAN.

Subnet Mask

A binary value used to divide IP networks into smaller subnetworks or subnets. This mask is used to help determine whether IP packets need to be forwarded to other subnets.

Gateway Address

A gateway address is the IP address of a hardware device (gateway) that translates data between two incompatible networks, which can include protocol translation.

MAC Address

This menu item is the Manufacturer's Assigned Number, and is unique for each printer. It is read-only.

DHCP

You can enable/disable the DHCP protocol using this option, but consult your administrator for the appropriate setting.

The options include:

- **Disable** (default)
- **Enable**.

Adapter Parameters Submenu

```
┌─────────────────┐
│   Adapter       │                                          * = Factory Default
│  Parameters     │
│ (from page 155) │
└─────────────────┘
```

Buffer Size In Kilobytes	Novell Protocol	Nest Serv Type	NetBIOS Protocol	Novell Frame	ASCII Data Port
16* 1-16	Enable* Disable	Auto* Bindery NDS	Enable* Disable	Auto Sensing* Ethernet II Ethernet 802.3 Ethernet 802.2 802.2 Snap	9100* 9099 - 9101

Keep-Alive Timer	Ethernet Speed	Job Control	Ethernet Hotport
3 Minutes* 2 - 10 Minutes	Auto Select* 10 Half Duplex 10 Full Duplex 100 Half Duplex 100 Full Duplex	Standard* Enhanced Off	Trickle Time 1/4 sec* 1/2 sec 1 sec 2 sec 4 sec 8 sec 16 sec OFF Timeout 10 sec* 11-60 sec Report Status Disable* Enable

```
┌────────────────────────────────────────┐
│ To view options, press:                │
│                                        │
│   Scroll ↑  Scroll ↓   Enter   Return  │
│   ┌──────┐  ┌──────┐  ┌─────┐  ┌──────┐ │
│   └──────┘  └──────┘  └─────┘  └──────┘ │
│                             Enter      │
│                            ┌─────┐     │
│ To select an option, press: └─────┘     │
│                                        │
│ To exit the configuration menus        │
│ and return to READY, press:   Start    │
│                              ┌──────┐   │
│                              └──────┘   │
│ * = Factory Default                    │
└────────────────────────────────────────┘
```

Buffer Size In Kilobytes

Configures the amount of memory allocated for the Adapter Parameters. You can specify between 1 and 16 Kbytes, in 1-Kbyte increments. The default is 16 Kbytes.

Novell Protocol

This option determines whether the Novell protocol will be available. The selections are as indicated below:

- **Enable** (default). Makes the Novell protocol available with the ethernet adapter installed.
- **Disable**. Makes the Novell protocol unavailable during printer operation.

Nest Serv Type

You can change the Nest Server using this option, but consult your administrator for the appropriate setting.

The options are Bindery (the factory default), NDS, and Auto.

NetBIOS Protocol

This option determines whether the NetBIOS protocol will be available. The selections are as indicated below:

- **Enable** (default). Makes the NetBIOS protocol available with the ethernet adapter installed.
- **Disable**. Makes the NetBIOS protocol unavailable during printer operation.

Novell Frame

This selection determines which framing scheme will be used in processing Novell signals.

- **Auto Sensing** (default)
- **Ethernet II**
- **Ethernet 802.3**
- **Ethernet 802.2**
- **802.2 Snap**

ASCII Data Port

This option sets the port number for ASCII print jobs. The data port number needs to match your host system setting.

- **9100** (default)
- **0 - 65535**

Keep Alive Timer

This is the time that the Keep Alive Timer will run. With the Keep Alive Timer on, the tcp connection will stay connected even after the print job has terminated.

- **3 Minutes** (default)
- **2 - 10 Minutes**

Ethernet Speed

The Ethernet Speed menu allows compatibility with different systems and networks. The factory default is Auto Select.

• **Auto Select**. (default) This setting tells the 10/100Base-T NIC to perform an auto detection scheme and configure itself to be 10 Half Duplex, 10 Full Duplex, 100 Half Duplex, or 100 Full Duplex.

• **10 Half Duplex**. Tells the 10/100Base-T NIC to communicate at 10 Megabits per second using half duplex.

• **10 Full Duplex**. Tells the 10/100Base-T NIC to communicate at 10 Megabits per second using full duplex.

• **100 Half Duplex**. Tells the 10/100Base-T NIC to communicate at 100 Megabits per second using half duplex.

• **100 Full Duplex**. Tells the 10/100Base-T NIC to communicate at 100 Megabits per second using full duplex.

Job Control

The job control mode has three options:

• **Standard** (default). The NIC waits for the printer to finish receiving the current job before sending another job. The status line shows "done" when the job is completely received by the NIC. This is the default.

• **Enhanced**. The NIC waits for the printer to finish receiving the current job before sending another job. The status line shows "done" when the job is fully printed.

• **Off**. No job synchonization between the NIC and the printer.
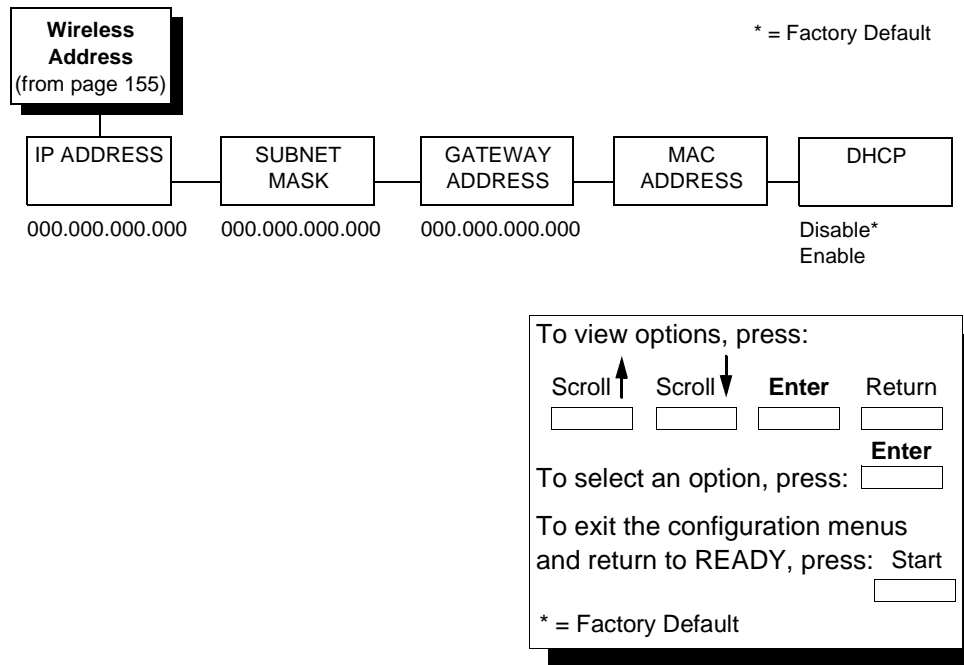
Ethernet Hotport

Gives the printer the ability to handle multiple data streams simultaneously. It allows the printer to service hosts attached to the serial, ethernet, and either the coax or twinax 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. This function is not applicable for C/T hotport.

- **1/4 Sec** (the default)
- **1/2 Sec**
- **1 Sec**
- **2 Sec**
- **4 Sec**
- **8 Sec**
- **16 Sec**
- **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.

- **10 Sec** (the default)
- **10 Sec - 60 Sec**

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, a fault on the printer is reported only if it occurs on the active port.

- **Disable** (the default)
- **Enable**.

Ethernet Address Submenu

```
┌─────────────┐
│  Ethernet   │                                    * = Factory Default
│  Address    │
│(from page 155)│
└─────────────┘

┌───────────┐   ┌───────────┐   ┌───────────┐   ┌───────────┐   ┌───────────┐
│IP ADDRESS │───│ SUBNET    │───│ GATEWAY   │───│ MAC       │───│ DHCP      │
│           │   │ MASK      │   │ ADDRESS   │   │ ADDRESS   │   │           │
└───────────┘   └───────────┘   └───────────┘   └───────────┘   └───────────┘

XXX.XXX.XXX     XXX.XXX.XXX     XXX.XXX.XXX     hhhhhhhhhhhh    Disable*
                                                                Enable
```

```
┌──────────────────────────────────────────────┐
│ To view options, press:                       │
│                                               │
│    Scroll ↑   Scroll ↓   Enter    Return      │
│    ┌─────┐    ┌─────┐    ┌─────┐   ┌─────┐     │
│    └─────┘    └─────┘    └─────┘   └─────┘     │
│                                    Enter       │
│ To select an option, press: ┌─────┐           │
│                             └─────┘           │
│ To exit the configuration menus               │
│ and return to READY, press:  Start            │
│                             ┌─────┐           │
│                             └─────┘           │
│ * = Factory Default                           │
└──────────────────────────────────────────────┘
```

IP ADDRESS

A numeric address such as 123.45.61.23 which identifies a printer or server in a LAN or WAN.

SUBNET MASK

A binary value used to divide IP networks into smaller subnetworks or subnets. This mask is used to help determine whether IP packets need to be forwarded to other subnets.

GATEWAY ADDRESS

A gateway address is the IP address of a hardware device (gateway) that translates data between two incompatible networks, which can include protocol translation.

MAC ADDRESS

This menu item is the Manufacturer's Assigned Number, and is unique for each printer. It is read-only.

DHCP

You can enable/disable the DHCP protocol using this option, but consult your administrator for the appropriate setting. The options are:

- **Disable** (the default)
- **Enable**.

161

Ethernet Parameters Submenu

* = Factory Default

Ethernet Parameters
(from page 155)

Buffer Size in Kilobytes	NetBIOS Protocol	ASCII Data Port Number	Keep-Alive Timer	Ethernet Speed
16* (1-16)	Enable* Disable	9100* 0 - 65535	3 Minutes* 2 - 10 Min	Auto Select* 10 Half Duplex 10 Full Duplex 100 Half Duplex 100 Full Duplex

Job Control	Ethernet Hotport
Standard* Enhanced Off	Timeout 10 Sec* 10 Sec - 60 Sec

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

Detailed information regarding the Ethernet IP Address, Gateway Address, Subset Mask, and MAC Address capabilities can be found in the *Ethernet Interface User's Manual.* Access to the parameters is through the operator panel.

Buffer Size in Kilobytes

This parameter determines the size of the input buffer, in 1K increments. A selection of up to 16K is shown.

- **16K** (the default)

- **1 – 16**.

- **NDS**.

NetBIOS Protocol

This option determines whether the NetBIOS protocol will be available. The selections are as indicated below:

- **Enable** (the default). Makes the NetBIOS protocol available with the integrated ethernet installed.

- **Disable**. Make the NetBIOS protocol unavailable during printer operation.

ASCII Data Port Number

This option sets the port number for ASCII print jobs. The data port number needs to match your host system setting.

- **9100** (the default)

- **0 – 65535**

Keep-Alive Timer

This is the time that the Keep Alive Timer will run. With the Keep Alive Timer on, the tcp connection will stay connected even after the print job has terminated.

- **3 Min** (the default)

- **2 – 10 Min**

Ethernet Speed

The Ethernet Speed menu allows compatibility with different systems and networks. The factory default is Auto Select.

- **Auto Select** (the default). This setting tells the 10/100Base-T NIC to perform an auto detection scheme and configure itself to be 10 Half Duplex, 10 Full Duplex, 100 Half Duplex, or 100 Full Duplex.

- **10 Half Duplex**. This setting tells the 100 Base-T NIC to communicate at 10 Megabits per second using half duplex.

- **10 Full Duplex**. This setting tells the 100 Base-T NIC to communicate at 10 Megabits per second using full duplex.

- **100 Half Duplex**. This setting tells the 100 Base-T NIC to communicate at 100 Megabits per second using half duplex.

- **100 Full Duplex**. This setting tells the 100 Base-T NIC to communicate at 100 Megabits per second using full duplex.

Job Control

The job control mode has three options:

- **Standard** (the default). The NIC waits for the printer to finish receiving the current job before sending another job. The status line shows "done" when the job is completely received by the NIC. This is default.

- **Enhanced**. The NIC waits for the printer to finish receiving the current job before sending another job. The status line shows "done" when the job is fully printed.

- **Off**. No job synchronization between the NIC and the printer.

Ethernet Hotport

Gives the printer the ability to handle multiple data streams simultaneously. It allows the printer to service hosts attached to the serial, ethernet, and either the coax or twinax ports as if they were the only interface connected.

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.

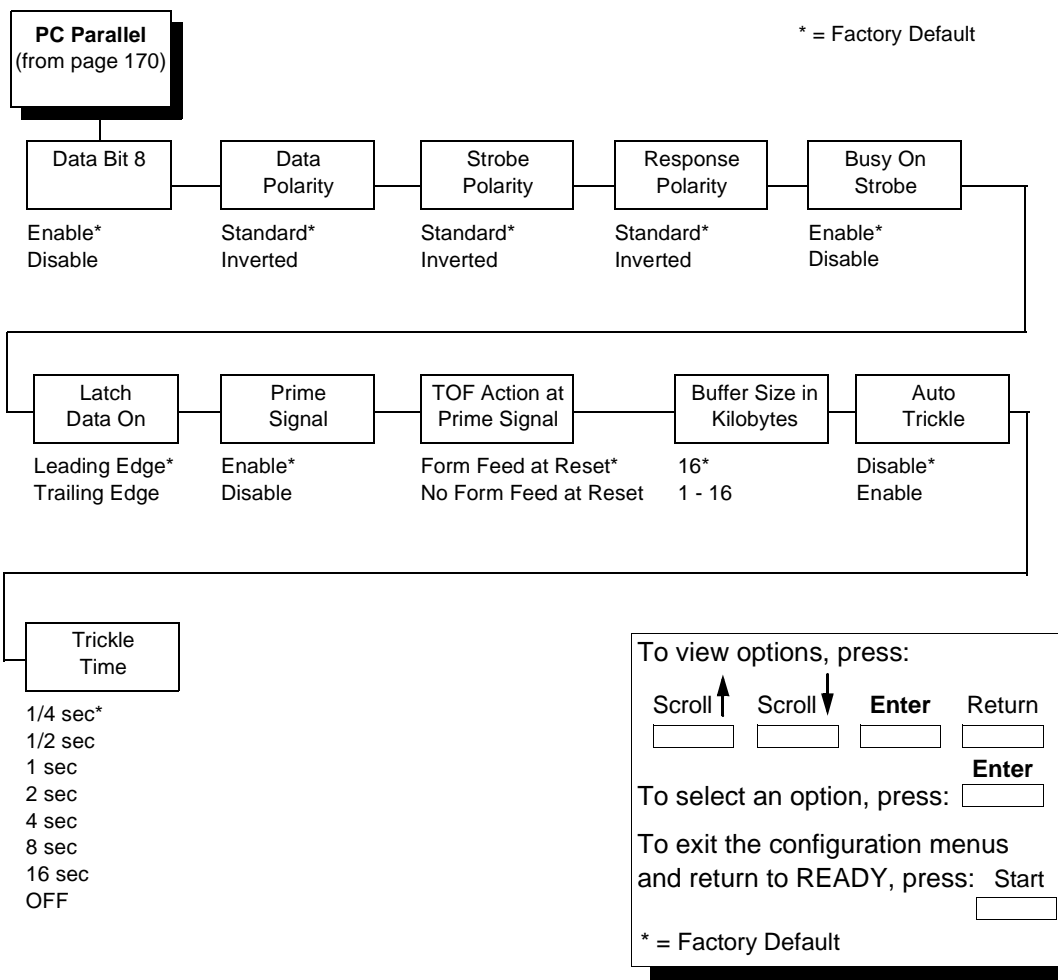- **10 Sec** (the default)
- **10 Sec - 60 Sec**

Wireless Address Menu

```
┌──────────────┐
│  Wireless    │                                    * = Factory Default
│  Address     │
│ (from page 155)│
└──────────────┘
    │
┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
│IP ADDRESS│───│ SUBNET   │───│ GATEWAY  │───│  MAC     │───│  DHCP    │
│          │   │  MASK    │   │ ADDRESS  │   │ ADDRESS  │   │          │
└──────────┘   └──────────┘   └──────────┘   └──────────┘   └──────────┘

000.000.000.000  000.000.000.000  000.000.000.000              Disable*
                                                                Enable
```

```
To view options, press:

  Scroll↑   Scroll↓   Enter    Return
  ┌─────┐  ┌─────┐  ┌─────┐  ┌─────┐
  └─────┘  └─────┘  └─────┘  └─────┘

                              Enter
To select an option, press:  ┌─────┐
                             └─────┘

To exit the configuration menus
and return to READY, press:  Start
                             ┌─────┐
                             └─────┘

* = Factory Default
```

IP Address

A numeric address such as 123.45.61.23 which identifies a printer or server in a LAN or WAN.

Subnet Mask

A binary value used to divide IP networks into smaller subnetworks or subnets. This mask is used to help determine whether IP packets need to be forwarded to other subnets.

Gateway Address

A gateway is the IP address of a hardware device (gateway) that translates data between two incompatible networks, which can include protocol translation.

MAC Address

This menu item is the Manufacturer's Assigned Number, and is unique for each printer. It is read-only.

DHCP

You can enable/disable the DHCP protocol using this option, but consult your administrator for the appropriate setting. The options include:

- **Disable** (default)
- **Enable**

Wireless Parameters Menu

Wireless Parameters
(from page 155)

* = Factory Default
1 = Only when 40 Bites is selected
2 = Only when 128 Bits is selected

Signal Strength	SSID Name	Operation Mode	Minimum Transfer Rate	Channel
0%	SSID Name (01 - 15)* SSID Name (16 - 30) SSID Name (31 - 32)	Ad Hoc* Infrastructure Pseudo IBSS	Auto-negotiate* 1Mb/sec 2Mb/sec 5.5Mb/sec 11Mb/sec	Default* 1 - 15

Antenna Diversity	Preamble	Power Management	Transmit Power	International Mode	Default WEP Key
Diverse* Primary Auxiliary	Default* Short Long	0 ms.* 100 ms. 200 ms. 300 ms. 400 ms. 500 ms. 600 ms. 700 ms. 800 ms. 900 ms. 1000 ms.	100%* 0 - 100 %	Disable* Enable	0* 1 2 3 4

WEP Key 1	WEP Key 2	WEP Key 3	WEP Key 4	WEP Key 1

Key Format
  ASCII
  Hexadecimal*
Key Width
  40 Bits
  128 Bits*
Byte1: - Bytes5 [1]
Byte1: - Bytes13 [2]
	Key Format
	  ASCII
	  Hexadecimal*
	Key Width
	  40 Bits
	  128 Bits*
	Byte1: - Bytes5 [1]
	Byte1: - Bytes13 [2]
		Key Format
		  ASCII
		  Hexadecimal*
		Key Width
		  40 Bits
		  128 Bits*
		Byte1: - Bytes5 [1]
		Byte1: - Bytes13 [2]
			Key Format
			  ASCII
			  Hexadecimal*
			Key Width
			  40 Bits
			  128 Bits*
			Byte1: - Bytes5 [1]
			Byte1: - Bytes13 [2]	

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus and return to READY, press: Start

* = Factory Default

Signal Strength

This menu displays the strength of the wireless signal.

NOTE: This is a display value only and cannot be changed.

SSID Name

A 1 - 32 character, case sensitive string that identifies the group the printer talks to.

NOTE: The SSID name may be edited in three parts (1-15), (16-30), and (31-32).

For each part of the SSID name, 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 name you want to give to this SSID name, then press ENTER to save. The name you entered will now represent this SSID name on the printer's front panel. To exit this menu without saving, press any key other than the ENTER key. The SSID name will revert to the last saved value.

Reset SSID Name

Allows you to reset the SSID name.

Operation Mode

Allows you to select the way the Wireless option communicates:

- **Infrastructure** (default). The Wireless option must go through a server.

- **Ad Hoc**. Standard, peer-to-peer communication (without a server). The two peers can be from different manufacturers.

- **Pseudo IBSS**. Proprietary, peer-to-peer communication (without a server). The two peers must be specific to one manufacturer.

Minimum Transfer Rate

Allows you to set the minimum speed at which the Wireless Option will accept a connection (in million bits per second). The options are:

- **Auto-negotiate** (default)

- **1Mb/sec.**

- **2Mb/sec.**

- **5.5Mb/sec**

- **11Mb/sec**

Channel

Allows you to select the RF channel. The options are Default (the factory default) and 1-15.

Antenna Diversity

The type of antenna used:

- **Diverse** (default). Select when you want to use the antenna with the best reception.

- **Primary**. Select when you want to use the Primary antenna on the server.

- **Auxiliary**. Select when you want to use the Auxiliary antenna on the server.

Preamble

The length of the preamble in transmit packets.

- **Default**. The Wireless option automatically determines the length.

- **Short**. For newer printers which can handle higher transer rate speeds.

- **Long**. For older printers which cannot handle higher transfer rate speeds.

Power Management

This allows you to set power-save mode and sleep time. A value specifying the sleep time in milliseconds will be provided. If set to zero, power-save mode will be disabled. The range includes:

- **0 ms.** (default)

- **100 ms. - 1000 ms.**

Transmit Power

The power level as a percentage of full power (0 - 100%).

International Mode

When enabled, the Wireless option adapts to international frequency requirements in Europe. The options include:

- **Disable** (default)

- **Enable**

Default WEP Key

This feature enables you to encrypt (scramble) information for security purposes. With this feature, you can set up to four encryption keys, in either ASCII or hexadecimal format, and in either 40 or 128 bits. (The more bits you choose, the more difficult it will be to decode the information.)

NOTE: None of the WEP Key Configuration menus display on the configuration printout.

WEP Key Format

Allows you to format the WEP keys in ASCII or hexadecimal code. The default is hexadecimal.

WEP Key Width

This is the encryption strength. The options are 40 Bits and 128 Bits; 40 Bits are weaker and 128 Bits are stronger.

NOTE: If you select 40 Bits, the WEP key BYTE6 through WEP Key BYTE13 menus will not display.

The default is 128 Bits.

WEP Key BYTE1 through BYTE13

These are the individual characters of the encryption key.

Reset WEP Keys

Allows you to reset all four WEP keys (WEP Key 1 through WEP Key 4) at one time.

Parallel Interface Menu

Refer to Chapter 5 for more information about printer interfaces.

* = Factory Default

```
┌─────────────────┐
│    Parallel     │
│   Interface     │
│ (from page 104) │
└─────────────────┘
```

Interface Type	PC Parallel	Dataproducts	IEEE 1284	Parallel Hotport

IEEE 1284*
PC Parallel
Dataproducts

See page 172.   See page 175.   See page 178.

Trickle Time
  1/4 Sec*
  1/2 Sec
  1 Sec
  2 Sec
  4 Sec
  8 Sec
  16 Sec
  OFF
Timeout
  10 Sec*
  1 Sec - 60 Sec
Report Status
  Disable*
  Enable

```
To view options, press:

Scroll ↑   Scroll ↓   Enter   Return
┌─────┐   ┌─────┐   ┌─────┐
                        Enter
To select an option, press: ┌─────┐

To exit the configuration menus
and return to READY, press:  Start
                           ┌─────┐

* = Factory Default
```

Interface Type

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

- **IEEE 1284** (the default)

- **PC Parallel**

- **Dataproducts**

PC Parallel

See page 172.

Dataproducts

See page 175.

IEEE 1284

See page 178.

Parallel Hotport

Gives the printer the ability to handle multiple data streams simultaneously. It allows the printer to service hosts attached to the serial, parallel, and either the coax or twinax ports as if they were the only interface connected.
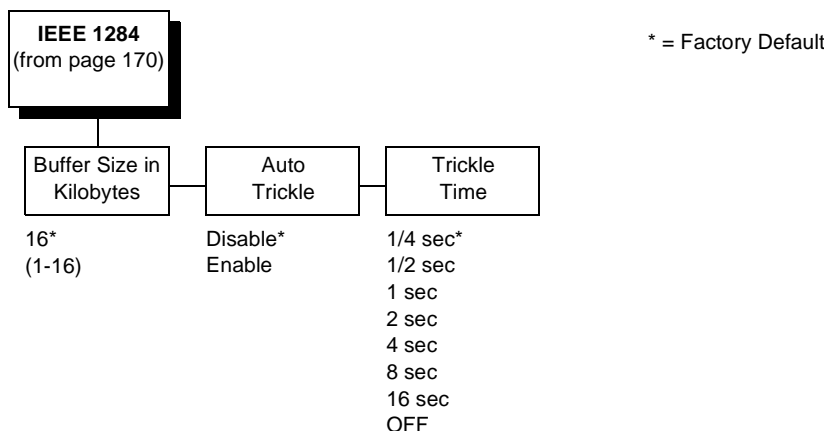
Trickle Time

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. This function is not applicable for C/T hotport.

- **1/4 Sec** (the default)
- **1/2 Sec**
- **1 Sec**
- **2 Sec**
- **4 Sec**
- **8 Sec**
- **16 Sec**
- **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.

- **10 Sec** (the default)
- **10 Sec - 60 Sec**

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, a fault on the printer is reported only if it occurs on the active port.

- **Disable** (the default)
- **Enable**.

PC Parallel Menu

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

PC Parallel (from page 170)

* = Factory Default

Data Bit 8	Data Polarity	Strobe Polarity	Response Polarity	Busy On Strobe
Enable* Disable	Standard* Inverted	Standard* Inverted	Standard* Inverted	Enable* Disable

Latch Data On	Prime Signal	TOF Action at Prime Signal	Buffer Size in Kilobytes	Auto Trickle
Leading Edge* Trailing Edge	Enable* Disable	Form Feed at Reset* No Form Feed at Reset	16* 1 - 16	Disable* Enable

Trickle Time

1/4 sec*
1/2 sec
1 sec
2 sec
4 sec
8 sec
16 sec
OFF

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus and return to READY, press: Start

* = Factory Default

Data Bit 8

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

The extended ASCII character set is shown in the *6400 ASCII Programmer's Reference Manual.*

- **Enable** (the default)
- **Disable**.

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 Kilobytes

This parameter determines the size of the input buffer, in 1K increments.

- **16K** (the default)
- **1 – 16K**

Auto Trickle

Auto Trickle is used to prevent a host computer from timing out because the parallel interface was busy for too long. When Auto Trickle is enabled and the printer's buffers are almost full, the printer will begin to trickle data in (at the rate set in the Trickle Time menu) until the buffers start to empty out.

Trickle Time

This functionality prevents an attached host from timing out. 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.

- **1/4 Sec** (the default)
- **1/2 Sec**
- **1 Sec**
- **2 Sec**
- **4 Sec**
- **8 Sec**
- **16 Sec**
- **OFF**

Dataproducts Menu

The Dataproducts parallel interface is configured using the following configuration options.

* = Factory Default
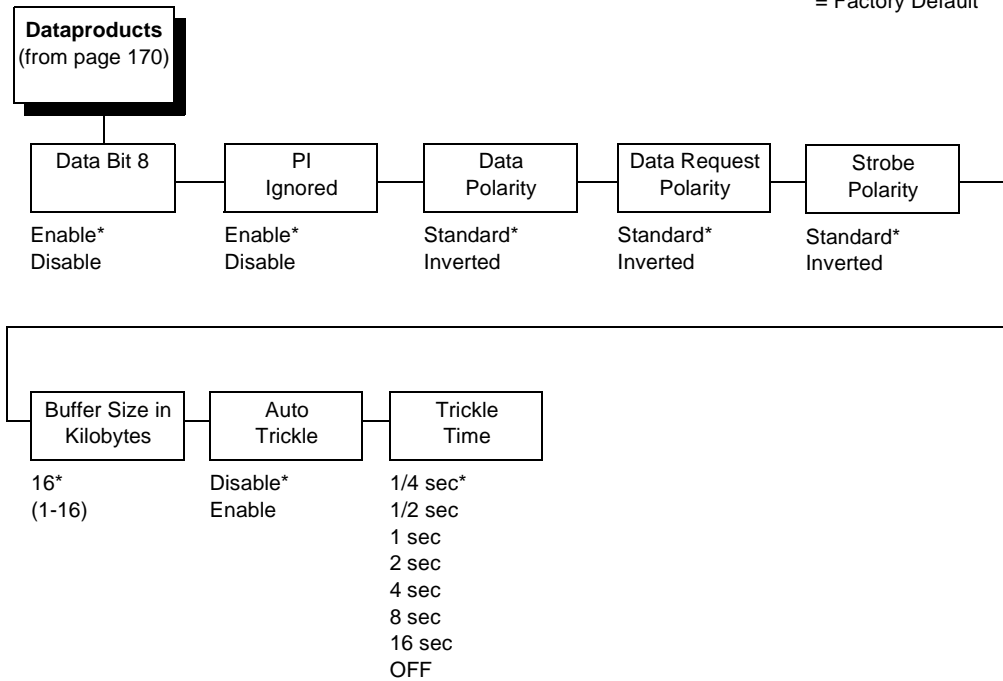
Dataproducts (from page 170)				
Data Bit 8	PI Ignored	Data Polarity	Data Request Polarity	Strobe Polarity
Enable* Disable	Enable* Disable	Standard* Inverted	Standard* Inverted	Standard* Inverted

Buffer Size in Kilobytes	Auto Trickle	Trickle Time
16* (1-16)	Disable* Enable	1/4 sec* 1/2 sec 1 sec 2 sec 4 sec 8 sec 16 sec OFF

To view options, press:

Scroll↑   Scroll↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

175

Data Bit 8

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

• **Enable** (the default)

• **Disable**.

PI Ignored

The PI (Paper Instruction) signal is used to control vertical paper motion.

• **Enable** (the default). Ignores the PI signal and treats the the data as characters or control codes.

• **Disable**. Causes the printer to interpret the eight data lines as VFU commands when the PI signal is true.

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.

Data Request Polarity

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

• **Standard** (the default). Does not invert the request signal.

• **Inverted**. Inverts the request signal sent to the host computer.

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.

Buffer Size in Kilobytes

This parameter determines the size of the input buffer, in 1K increments. Up to 16K are available.

• **16** (the default)

• **1 – 16**

Auto Trickle

Auto Trickle is used to prevent a host computer from timing out because the parallel interface was busy for too long. When Auto Trickle is enabled and the printer's buffers are almost full, the printer will begin to trickle data in (at the rate set in the Trickle Time menu) until the buffers start to empty out.

Trickle Time

This functionality prevents an attached host from timing out. 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.

- **1/4 Sec** (the default)
- **1/2 Sec**
- **1 Sec**
- **2 Sec**
- **4 Sec**
- **8 Sec**
- **16 Sec**
- **OFF**

IEEE 1284

The IEEE 1284 interface is configured using the following configuration options.

```
┌─────────────────┐
│    IEEE 1284    │                              * = Factory Default
│ (from page 170) │
└─────────────────┘
         │
  ┌──────┴──────────────┬──────────────────┐
┌──────────────┐  ┌──────────────┐  ┌──────────────┐
│ Buffer Size in│  │     Auto     │  │    Trickle   │
│  Kilobytes    │  │   Trickle    │  │     Time     │
└──────────────┘  └──────────────┘  └──────────────┘

16*                Disable*            1/4 sec*
(1-16)             Enable              1/2 sec
                                       1 sec
                                       2 sec
                                       4 sec
                                       8 sec
                                       16 sec
                                       OFF
```

```
┌─────────────────────────────────────────┐
│ To view options, press:                 │
│                                          │
│        ↑         ↓                       │
│ Scroll   Scroll    **Enter**    Return   │
│ ┌─────┐  ┌─────┐  ┌─────┐  ┌─────┐       │
│                                          │
│                            **Enter**     │
│ To select an option, press: ┌─────┐      │
│                                          │
│ To exit the configuration menus          │
│ and return to READY, press:  Start       │
│                             ┌─────┐       │
│                                          │
│ * = Factory Default                      │
└─────────────────────────────────────────┘
```

Buffer Size in Kilobytes

This parameter determines the size of the input buffer, in 1K increments. Up to 16K are available.

- **16** (the default)

- **1 – 16**

Auto Trickle

Auto Trickle is used to prevent a host computer from timing out because the parallel interface was busy for too long. When Auto Trickle is enabled and the printer's buffers are almost full, the printer will begin to trickle data in (at the rate set in the Trickle Time menu) until the buffers start to empty out.

Trickle Time

This functionality prevents an attached host from timing out. 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.

- **1/4 Sec** (the default)

- **1/2 Sec**

- **1 Sec**

- **2 Sec**

- **4 Sec**

- **8 Sec**

- **16 Sec**

- **OFF**

Serial Interface Menu

IMPORTANT   **The serial 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.**

```
                    Serial
                  Interface
               (from page 104)
```

Interface Type	Data Protocol	Baud Rate	Data Bits	Stop Bits
RS 232*	XON/XOFF*	9600* Baud	8*	1*
RS 422	ETX/ACK	19200 Baud	7	2
	ACK/NAK	38400 Baud		
	DTR	57600 Baud		
		115200 Baud		
		600 Baud		
		1200 Baud		
		2400 Baud		
		4800 Baud		

Parity	Data Terminal Ready	Request to Send	Buffer Size in Kilobytes	Poll Character
None*	Ready and Buffer Not Full*	True*	16*	00 Hex*
Odd	Not Ready or Buffer Full	Ready and Buffer Not Full	1 - 16	00 - FF Hex
Even	False	Not Ready or Buffer Full		
Mark	True	False		
Sense				

One Char Enquiry	Serial Hotport	Framing Errors
Disable*	Trickle Time	Enable*
Enable	1/4 Sec*	Disable
	1/2 Sec	
	1 Sec	
	2 Sec	
	4 Sec	
	8 Sec	
	16 Sec	
	OFF	
	Timeout	
	10 Sec*	
	1 Sec - 60 Sec	
	Report Status	
	Disable*	
	Enable	

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus and return to READY, press: Start

* = Factory Default

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.

- **9600 Baud** (the default)
- **19200 Baud**
- **38400 Baud**
- **57600 Baud**
- **115200 Baud**
- **600 Baud**
- **1200 Baud**
- **2400 Baud**
- **4800 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** (the default)
- **7**

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.

- **1** (the default)
- **2**

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, 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.

• **True** (the default). Continuously asserts the RTS signal.

• **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.

NOTE: Xon/Xoff is always on. See page 181 for more information.

Buffer Size in Kilobytes

This parameter determines the size of the input buffer, in 1K increments. Up to 16K are available.

• **16** (the default)

• **1 – 16**

Poll Character

This option is used when One Char Enquiry is enabled and the IGP feature is available. 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.

• **00 Hex** (the default)

• **00 – FF Hex**

One Char Enquiry

When enabled, and the IGP feature is available, 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.

• **Disable** (the default)

• **Enable**

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

Gives the printer the ability to handle multiple data streams simultaneously. It allows the printer to service hosts attached to the serial, parallel, and either coax or twinax ports as if they were the only interface connected.

Trickle Time

This functionality prevents an attached host from timing out. 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. This function is not applicable for C/T hotport.

- **1/4 Sec** (the default)
- **1/2 Sec**
- **1 Sec**
- **2 Sec**
- **4 Sec**
- **8 Sec**
- **16 Sec**
- **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.

- **10 Sec** (the default)

- **1 Sec – 60 Sec**

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, a fault on the printer is reported only if it occurs on the active port.

- **Disable** (the default)

- **Enable**

Framing Errors

These are possible errors that can occur when serial interface settings of the printer do not match those of the host computer.

- **Enable** (the default). If a framing error occurs, a fault message will display on the control panel.

- **Disable**. If a framing error occurs, a fault message will not display on the control panel.

Emulation Configuration Menu

```
┌─────────────────────┐
│ Emulation           │
│ Configuration       │
│ (from page 104)     │
└─────────────────────┘
```

Active Emulation	IPDS[1]	ANSI Emulation[1]	IGP Emulation[1]	Code V Emulation[1]

ANSI Printer Emulation*   See page 188   See page 195   See page 204   See page 210
IGP & ASCII Printer Emulations
Code V & ASCII Printer Emulations
IPDS

ASCII Printer Emulation	Printer Emulation Configuration	Print Format

P-Series Emulation*   See page 219   See page 234
P-Series XQ Emulation
Serial Matrix Emulation
Proprinter III XL Emulation
Epson Emulation [1]

[1] = If installed

```
┌────────────────────────────────────┐
│ To view options, press:            │
│                                    │
│  Scroll↑  Scroll↓  Enter   Return  │
│  ┌────┐  ┌────┐  ┌────┐  ┌────┐    │
│  └────┘  └────┘  └────┘  └────┘    │
│                          Enter     │
│ To select an option, press: ┌────┐ │
│                             └────┘ │
│ To exit the configuration menus    │
│ and return to READY, press:  Start │
│                             ┌────┐ │
│                             └────┘ │
│ * = Factory Default                │
└────────────────────────────────────┘
```

Your printer can support many emulations: Proprinter III XL, Epson, P-Series, P-Series XQ, and Serial Matrix. These emulations are included with your printer.

Your printer can support other emulations: IPDS, Code V, and IGP. 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.) For the IPDS Coax/Twinax emulation, the IBM Coax/Twinax feature must be installed.

Active Emulation

This parameter allows you to select either of the following emulations:

- **ANSI Emulation** (the default)

- **IGP**. See page 186.

- **Code V**. See page 186.

- **IPDS**

ASCII Printer Emulation

This parameter selects one of the following ASCII printer emulations as the active emulation:

- **P-Series Emulation** (the default)

- **P-Series XQ Emulation**

- **Serial Matrix Emulation**

- **Proprinter III XL Emulation**

- **Epson Emulation**

The configuration for the active emulation is selected from the Printer Emulation Configuration menu, described on page 186.

Printer Emulation Configuration

This parameter configures the ASCII printer emulation and page formatting. The submenus are described on page 219.

Print Format

This parameter configures page formatting. The submenus are described beginning on page 234.

IPDS Feature

Configuration

Matching printer operational settings to those of the host computer is known as "printer configuration." The settings, or configuration parameters, such as selecting the host interface, are adjusted according to the operator panel key descriptions. Configure the IPDS in the same way you would configure the printer for other features.

You can select IPDS default parameters directly from the operator panel as explained in this chapter, or by application commands as explained in the *6400 IPDS Programmer's Reference Manual.*

IPDS Parameters

The IPDS parameters are described on the following pages. Parameters marked with an asterisk (*) indicate the default value. The printer must be offline to enter the configuration structure.

Enter and exit the IPDS configuration menu according to the configuration procedures in Chapter 3, "Configuring the Printer." Pressing an invalid key to enter a parameter value may move you to another level in the configuration or exit the configuration menu completely.

IMPORTANT **BEFORE you reconfigure the IPDS, print a configuration sheet to see all of the current settings. Refer to "Printing The Current Configuration" on page 85.**

Configure the IPDS according to your specific requirements. The IPDS configuration menu is shown on the following page.

IPDS Configuration Menu
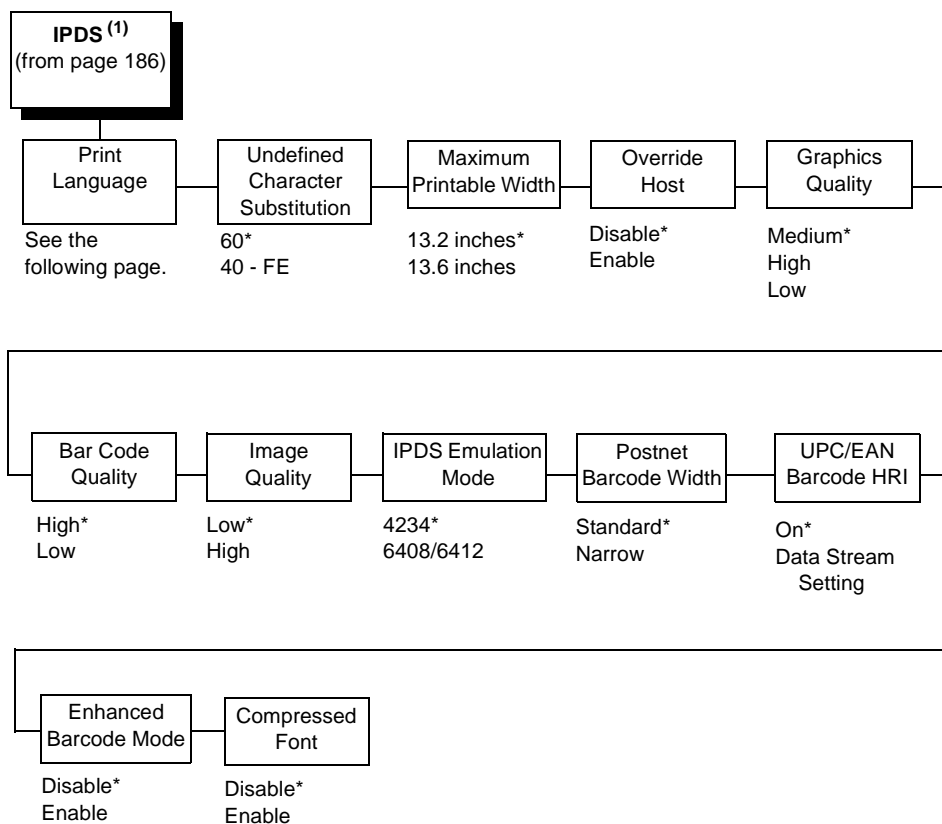
```
┌──────────────┐
│   Print      │
│  Language    │
│(from page 188)│
└──────────────┘
        │
┌──────────────┐
│Standard Print│
│  Language    │
└──────────────┘
```

0037 English (USA/Canada)*
0037 English (Netherlands)
0285 English (UK/Ireland)
0273 Austrian/German
0274 Belgian Old
0275 Brazilian
0260 Canadian French
0277 Danish/Norwegian
0287 Danish/Norwegian (Alternate)
0278 Finnish/Swedish
0288 Finnish/Swedish (Alternate)
0297 French/French Azerty
0500 International Set 5
0280 Italian
0281 Japanese English
0282 Portuguese
0284 Spanish/Spanish Speaking
0289 Spanish (Alternate)
0500 Swiss Bilingual
0500 Belgian New
0803 Hebrew Old (089)
0424 Hebrew
0892 ORC A
0893 ORC B
0420 Arabic
0880 Cyrillic Old
0423 Greek Old
0875 Greek New (Euro)
0871 Icelandic
0290 Japanese Katakana
0870 Latin 2/Roece/Multilingual
0838 Thai
1026 Turkish
0890 Yugoslav Old
1097 Farsi
1025 Cyrillic Multilingual
0905 Turkish Old
0256 International Set 1
0924 Euro Latin 9
1140 Euro English (USA/Canada)
1141 Euro Austrian/German
1142 Euro Danish/Norwegian
1143 Euro Finnish/Swedish
1144 Euro Italian
1145 Euro Spanish Speaking
1146 Euro English (UK/Ireland)
1147 Euro French (Azerty 105)
1148 Euro Swiss Bilingual
1149 Euro Icelandic
1112 Baltic Multilingual
OCR-B Katakana
1122 Estonian

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return
[____]   [____]   [____]   [____]

                                    Enter
To select an option, press: [____]

To exit the configuration menus
and return to READY, press: Start
                             [____]

* = Factory Default

189

Print Language (TCP/IP IPDS)

PRINT LANGUAGE specifies the set of print languages used by the printer. Refer to the previous page for print language menus.

Specifying a print *quality* of OCR A or OCR B will change the print *language* to OCR A or OCR B.

When OCR A or OCR B is selected as the default print language, OCR A and OCR B are the only available values for this parameter. If a different print quality value is desired, the print language must be changed first.

NOTE: This configuration value applies only to IPDS on the Ethernet. For Coax or Twinax IPDS, use the corresponding configuration value in the Coax or Twinax Interface menu.

Undefined Character Substitution (TCP/IP IPDS)

Undefined Character Substitution specifies the replacement character to print in place of any unprintable character that is received by the host.

- **60** (the default)

- **40 – FE**

NOTE: This configuration value applies only to IPDS on the Ethernet. For Coax or Twinax IPDS, use the corresponding configuration value in the Coax or Twinax Interface menu.

Maximum Printable Width (TCP/IP IPDS)

Maximum Printable Width sets the maximum width of the printer when using an IPDS host interface.

- **13.2 Inches** (the default)

- **13.6 Inches**

NOTE: This configuration value applies only to IPDS on the Ethernet. For Coax or Twinax IPDS, use the corresponding configuration value in the Coax or Twinax Interface menu.

Override Host (Emulation Configuration)

Override Host determines if the operator panel overrides specified IPDS menu values.

Select one of the following two values:

- **Disable** (the default). Does not allow operator panel settings to override IPDS application commands.

- **Enable**. Allows operator panel settings to override IPDS application commands.

The specified IPDS application commands for the IPDS menu values are:

- **Graphics Quality**

- **Bar Code Quality**

- **Image Quality**

NOTE: No other IPDS menu values or printer operator panels are affected by Override Host. Only the three values listed above are affected.

Graphics Quality

Determines the quality for graphics printing. Override Host must be enabled to use these settings. Here are the supported resolutions in pels:

- **Medium** (the default). Vertical is 144; horizontal is 120.

- **High**. Vertical is 144; horizontal is 180.

- **Low**. Vertical is 72; horizontal is 60.

NOTE: The higher the resolution selected, the slower the print speed. When selecting a resolution, try to balance the resolution quality your application requires with how fast you want the print job to print.

Bar Code Quality

Determines the quality for graphics printing. Override Host must be enabled to use these settings. Below are the values for non-rotated bar codes.

- **High** (the default) Vertical is 144; horizontal is 120.

- **Low**. Vertical is 72; horizontal is 60.

NOTE: The higher the resolution you select, the slower the print speed. When selecting a resolution, try to balance the resolution quality your application requires with how fast you want the print job to print.

Image Quality

Determines the quality for image printing. Override Host must be enabled to use Image Quality. If Override Host is disabled, then the image is assumed to be 144 by 144 and the image is printed at 120 by 144.

- **Low** (the default). Accepts images with 144 by 144 and prints images at 120 by 144. With this setting, the image is converted from 144 by 144 to 120 by 144. Since there is some conversion required, there may be some differences between the original image and the printed image. Review the note below for more information.

- **High**. Accepts images with 120 by 144 and prints images 120 by 144. With this setting, the image is printed as is and requires no conversion. Because no conversion is required, there is more fidelity between the original image and the printed image.

NOTE: There is one bit of image data per pel. If your print job contains an image created to print 144 by 144, which is very common for IBM 4234 printers, some bits of data will be dropped out to support the best fit resolution, which is 120 by 144.

When printing jobs with images created for an IBM 4234 printer, you will want to print a few samples to ensure the results are satisfactory.

IPDS Emulation Mode

Select which type of printer you want IPDS to support. You can choose either to emulate a 4234 or you can choose 6408/6412. You should choose which mode you use based on your software applications. For instance, if you are using PSF/MVS, then you would choose 6408/6412 as PSF/MVS provides support for this printer.

- **4234** (the default). IPDS supports 4234 printer functions. This is the default which should be used most often. If you are using IPDS with PSF applications, except PSF/MVS, make sure you select 4234.

  Please review Chapter 3, "IPDS Commands Reference" in your *6400 IPDS Programmer's Reference Manual* for information on using IPDS commands when you select 4234 from the IPDS Emulation Mode menu.

- **6408/6412**. IPDS supports 6408/6412 printer functions. Use this value when you are using IPDS with PSF/MVS. This value enables IPDS and PSF/MVS to take advantage of 6408/6412 printer functions which are supported directly by PSF/MVS. Other PSF applications only support this printer as a 4234 printer.

  Please review Chapter 4, "IPDS Command Differences" in your *6400 IPDS Programmer's Reference Manual* for information on using IPDS commands when you select 6408/6412 from the IPDS Emulation Mode menu.

NOTE: If you want to use the value 6408/6412 as the default value, you will need to select 6408/6412 as the default, save the value as a custom set, and then power the printer off and back on again.

Postnet Barcode Width

Determines the width of Postnet bar code. This option applies to non-rotated Postnet bar codes.

- **Standard** (the default). Postnet bar codes are printed at the standard width.

- **Narrow**. Postnet bar codes are printed with a narrow width.

NOTE: The printer caches bar codes to improve performance. Therefore, to change this configuration value, you will need to select the desired setting, save the value in a custom set, then power the printer off and then power the printer back on.

UPC/EAN Barcode HRI

Determines whether bar code HRI (human readable information) prints with UPC and EAN bar codes.

- **On** (the default). The printer always prints HRI with UPC and EAN bar codes, regardless of the HRI flag contained in the IPDS bar code application command.

- **Data Stream Setting**. The printer uses the HRI flag in the IPDS bar code application command to determine whether or not to print HRI with UPC and EAN bar codes. See the *6400 IPDS Programmer's Reference Manual* for more information about IPDS bar code application commands.

Enhanced Bar Code Mode

The Enhanced Bar Code Mode option interweaves the dots in IPDS bar codes so that more bar codes can be printed before the printer ribbon must be replaced.

- **Disable** (the default). Bar codes are printed in one of the standard qualities, as determined by the Bar Code Quality option and IPDS application commands.

- **Enable**. Bar codes are printed in the enhanced mode.

Only certain bar code types, sizes, an orientations are supported in Enhanced Bar Code Mode.

- Only bar codes with a unit module width of 0.017 inches are supported in Enhanced Bar Code Mode.

- For non-rotated bar codes, all bar code types except Postnet and Royal Mail are supported in Enhanced Bar Code Mode. Enhanced bar codes printed in these orientations will print at approximately the same speed as standard high quality bar codes.

- For rotated bar codes, all bar code types except Postnet, Royal Mail, UPC, EAN, and Code 128 are supported in Enhanced Bar Code Mode. Enhanced bar codes printed in these orientations will print slower than standard high quality bar codes.

NOTE: Bar codes that are printed in Enhanced Bar Code Mode that are not supported in this mode will print in standard high quality.

Compressed Font

The Compressed Font option allows the printer to print vertically compressed (short) fonts available on the IBM 4234 IPDS printer.

- **Disable** (the default). Normal size fonts are substituted whenever compressed fonts are requested.

- **Enable**. Compressed fonts are printed when requested by IPDS application commands. See the *6400 IPDS Programmer's Reference Manual* for more information about selecting these fonts with application commands.

ANSI

EMULATION
(from page 186)

* = Factory Default

ANSI/IGP
Emulation

CPI/LPI Select	Font Attributes	Page Format	Define CR Code	Auto LF	Define LF Code
Select CPI	(see next page)	(see next page)	CR = CR*	Disable*	LF = CR + LF*
10.0* CPI			CR = CR + LF	Enable	LF = LF
12.0 CPI					
13.3. CPI					
15.0 CPI					
16.7 CPI					
17.1 CPI					
Select LPI					
6.0* LPI					
3.0 LPI					
4.0 LPI					
8.0 LPI					

Character Set	Printer Select	ESC c Sequence	Reset Command	Received CR	Received DEL	Private Mode
(see next page)	ON=DC1/ OFF=DC3*	Enable*	Disable*	Observe*	Observe*	Set 2*
	Disable	Disable	Power up config.	Ignore	Ignore	Set 1
			Current config			
			Factory config.			

Pos. on BC/OvrSz	BC Check Digit	Barcode Darkmode	PUM Default	Truncate PI Slew
Set to top*	By host*	Enable*	Decipoints*	Truncate at TOF*
Set to bottom	By printer	Disable	Lines/Columns	Disable

* = Factory Default

Font Attributes
(from page 195)

Typeface	Prop. Spacing	Bold Print	Slashed Zero

Data Processing*
Gothic NLQ
Character Graphics
High Speed
Italics NLQ
Courier NLQ
OCR-A
OCR-B

Disable*
Enable

Disable*
Enable

Disable*
Enable

Character Set
(from page 195)

Latin 1 8859-1*
Cyrillic 8859-5
IBM PC-2 CP 437
IBM PC-2 CP 850
Slavic CP 852
Cyrillic CP 855
French Canadian. CP 863
Russian CP 866
Greek CP 851
Turkish CP 853
Portug. CP 860
Arabic CP 864
Nordic CP 865
Latin 2 8859-2
Latin 3 8859-3
Latin 4 8859-4
Latin Arabic 8859-6
Latin Greek. 8859-7
Latin Hebrew 8859-8
Latin 5 8859-9
Turkish2 CP 867
Pol. Maz. CP 8576
Turkish CP 8577
Greek CP 8573
Italian CP 23
Spanish CP 24

Latin 9 8859-15
DEC 256 Greek
Turkish CP 857
USA
German
French A
French B
French Canadian
Dutch Netherlands
Italian
United Kingdom
Spanish
Danish/Norw. A
Danish/Norw. B
Danish/Norw. C
Danish/Norw. D
Swedish/Finnish A
Swedish/Finnish B
Swedish/Finnish C
Swedish/Finnish D
Swiss
USA
Yugoslavian
United Kingdom A
Turkish
Greek
DEC Mult.
Roman 8

Page Format
(from page 195)

Margins	Form Length	Form Width

Left Margin
 0 columns*
 (0-369)
Right Margin
 0 columns*
 (0-369)
Top Margin
 0 lines*
 (0-451)
Bottom Margin
 0 lines*
 (0-451)

Function of Lines
 66 lines*
 (1-65)

Function of CPI
 136 Characters*
 (1-135)

CPI/LPI Select

Defines the default values for the horizontal and vertical character spacing. The number of characters per inch can range from 10.0 through 17.1. The number of lines per inch can range from 3.0 through 8.0.

CPI Select

- **10.0 CPI** (the default)
- **12.0 CPI**
- **13.3. CPI**
- **15.0 CPI**
- **16.7 CPI**
- **17.1 CPI**

Select LPI

- **6.0 LPI** (the default)
- **3.0 LPI**
- **4.0 LPI**
- **8.0 LPI**

Font Attributes

Typeface

Choose a typeface from the available options.

- **Data Processing** (the default). A general purpose font printing out at 120 dpi horizontally and 72 dpi vertically. The width of the font will vary with each cpi.
- **Gothic NLQ**. A high quality font printing at 180 dpi horizontally and 96 dpi vertically. This font has serifs and the width of the font varies with the cpi.
- **Character Graphics**.
- **High Speed**. A draft quality font printing at 120 dpi horizontally and 48 dpi vertically. The width of the font varies with the cpi.
- **Italics NQL**.
- **Courier NQL**.
- **OCR-A / OCR-B**. Optical character recognition fonts printing at 120 dpi horizontally and 144 dpi vertically. Both fonts print only at 10 cpi.

Prop. Spacing (Proportional Spacing)

Each printed character is contained inside a character cell. The width of the character cell includes the character and the space around the character.

- **Disable** (the default). Each character cell is printed with the same width. Each column in the printed text will line up.

```
This example is printed with
proportional spacing disabled.
```

- **Enable**. The width of each character cell varies with the width of the character. For example, [i] takes less space to print than [m]. Using proportional fonts generally increases the readability of printed documents, giving text a typeset appearance.

```
This example is printed with
proportional spacing enabled.
```

Bold Print

- **Disable** (the default). Text is printed normally.
- **Enable**. Text is printed with a heavy line thickness.

Slashed Zero

This parameter allows you to print the numeral "0" with or without the slash. This option applies to all character sets except OCR-A and OCR-B.

- **Disable** (the default). Zero is printed without a slash.
- **Enable**. Zero is printed with a slash.

Page Format

Margins

- **Left Margin**. Defines where the first print column is located. The left margin is specified as the number of characters from the left edge of the form.

- **Right Margin**. Defines where the last print column is located. The right margin is specified as the number of characters from the right edge of the form.

- **Top Margin**. Defines the location of the first print line on the page. The top margin is specified as the number of lines from the top of the form's position.

- **Bottom Margin**. Defines the location of the last print line on the page. The bottom margin is specified as the number of lines from the bottom of the form's position.

Form Length

Specifies the form length in lines. The maximum form length in lines depends on the current LPI setting; it is equal to the maximum form length in inches multiplied by the current LPI setting. For example, at 6 LPI the maximum form length is 6 LPI x 24 inches = 144 lines.

Only valid form length values will be accepted. If you select a length that is larger than the maximum length for the current LPI, the maximum length will be used. If you need a longer page length, you must first change the LPI. The default is 66 lines.

IMPORTANT **If the form length is set in lines and you change the LPI, the effective page length changes to the form length in characters divided by the new LPI.**

> **NOTE:** Receipt of a data stream control code which changes the form length overrides the form length previously specified via the operator panel.

Form Width

Allows you to input the form width in characters from 1 through 272. The maximum form width in characters depends on the current CPI setting; it is equal to the maximum form width in inches multiplied by the current CPI setting.

Only valid form width values will be accepted. If a width is selected that is larger than the maximum width for the current CPI, then the maximum width will be used. If a larger width value is desired, then the CPI value must be changed first. The default is 136 lines.

Table 3 lists the maximum number of characters that can be printed for a given Characters Per Inch (CPI) setting.

IMPORTANT **If the form width is set in characters and the CPI is changed, the effective page width is changed to be equal to the form width in characters divided by the new CPI.**

Table 3. Form Width

CPI Setting	Maximum Form Width (in characters)
10.0	136
12.0	163
13.3	181
15.0	204
16.7	227
17.1	272

Define CR Code

The Define CR Code option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a carriage return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends line feeds to the printer.

- **CR = CR** (the default). No extra line feeds are inserted.

- **CR = CR + LF**. Inserts an extra line feed after each carriage return.

Auto LF

Defines the printer actions when print data is received past the form width setting.

- **Disable** (the default). Discards any data past the form width.

- **Enable**. Performs an automatic carriage return and line feed when data is received past the form width.

Define LF Code

Controls the action of the printer when it receives a Line Feed code (hex 0A) from the host computer. If this feature is enabled, each time the printer receives a line feed, it inserts an additional carriage return code (hex 0D) into the data stream. This feature can be used in most installations, but it is required if the host computer does not send carriage returns to the printer.

- **LF = CR + LF** (the default). Adds an extra carriage return with each line feed.

- **LF = LF**. Does not add a carriage return with a line feed.

Character Set

This parameter selects a character set for the ANSI emulation. Note that when 0876 OCR-A or 0877 OCR-B is selected as the print language, the Font Attributes Typeface parameter is changed to OCR-A or OCR-B, respectively. Character sets are shown in detail in the *Character Sets Reference Manual*.

Printer Select

*   **ON = DC1/OFF = DC3** (the default). Disables the printer when a DC1 control code is received, and enables the printer when a DC3 control code is received.

*   **Disable**. Ignores the DC1 and DC3 control codes.

ESC c Sequence

*   **Enable** (the default). An ESC c code received from the host resets the printer parameters to the factory defaults.

*   **Disable**. An ESC c code received from the host is ignored.

Reset Command

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

*   **Disable** (the default). The active emulation parameters are loaded when the reset command is executed.

*   **Power-Up Config**. The power-up configuration is loaded when the reset command is executed.

*   **Current Config**. The currently selected configuration is loaded when the reset command is executed.

*   **Factory Config**. The factory installed configuration is loaded when the reset command is executed.

Received CR

*   **Observe** (the default). A CR code received from the host is handled as a carriage return.

*   **Ignore**. A CR code received from the host is ignored.

Received DEL

*   **Observe** (the default). A DEL code received from the host is handled as a Delete command.

*   **Ignore**. A DEL code received from the host is ignored.

Private Mode

Determines the default type of character set (Set 1 or Set 2). This can also be set by ESC sequences ESC [>5h and ESC [>5l. Refer to these descriptions in the *ANSI Programmer's Reference Manual* for further details.

- **Set 2** (the default)
- **Set 1**

Pos. on BC/OvrSz

- **Set to Top** (the default). The paper is fed back to the top of barcodes or oversized characters after they are printed. This allows printing on the same line.
- **Set to Bottom**. The printer will continue printing without backing up.

BC Check Digit

- **By Host** (the default). The host calculates the barcode check digit and sends it along with the barcode. The check digit is not verified by the printer but printed as it was received.
- **By Printer**. The barcode is sent without the check digit, and the printer calculates and adds it in.

Barcode Darkmode

- **Enable** (the default). The barcodes are printed at a higher resolution.
- **Disable**. The barcodes are printed at lower resolution but at a higher speed.

PUM Default

This is the Unit of Measure (UOM) as it is used within the ANSI emulation. Coordinates received in ESC sequences can be sent in two UOMs: Decipoints, which is a unit of 1/720 inch, or in lines or columns using the current LPI and CPI values. The UOM used is determined by this configuration setting.

- **Decipoints** (the default)
- **Lines/Columns**

Truncate PI Slew

- **Truncate at TOF** (the default). The slew is terminated when the next Top-of-Form is reached. (This function applies to the ANSI EVFU only.)
- **Disable**. PI slews will be completed independent of their length.

IGP Feature (PGL)

Configuration

Matching printer operational settings to those of the host computer is known as "printer configuration." The settings, or configuration parameters, such as selecting the host interface, are adjusted according to the operator panel key descriptions. Configure the IGP feature in the same way you would configure the printer for other features.

You can select IGP default parameters directly from the operator panel as explained in this chapter, or by control codes as explained in the *6400 IGP User's Manual.*

IGP Parameters

The IGP parameters are described in the following pages. Parameters marked with an asterisk (*) indicate the default value. The printer must be off-line to enter the configuration structure.

Enter and exit the IGP configuration menu according to the configuration procedures in Chapter 3, "Configuring the Printer." Pressing an invalid key to enter a parameter value may move you to another level in the configuration or exit the configuration menu completely.

IMPORTANT **BEFORE you reconfigure the IGP, print a configuration sheet to see all of the current settings. Refer to Chapter 3, "Configuring the Printer."**

Configure the IGP according to your specific requirements.

The IGP configuration menu is shown on the following page.

IGP Emulation Menu
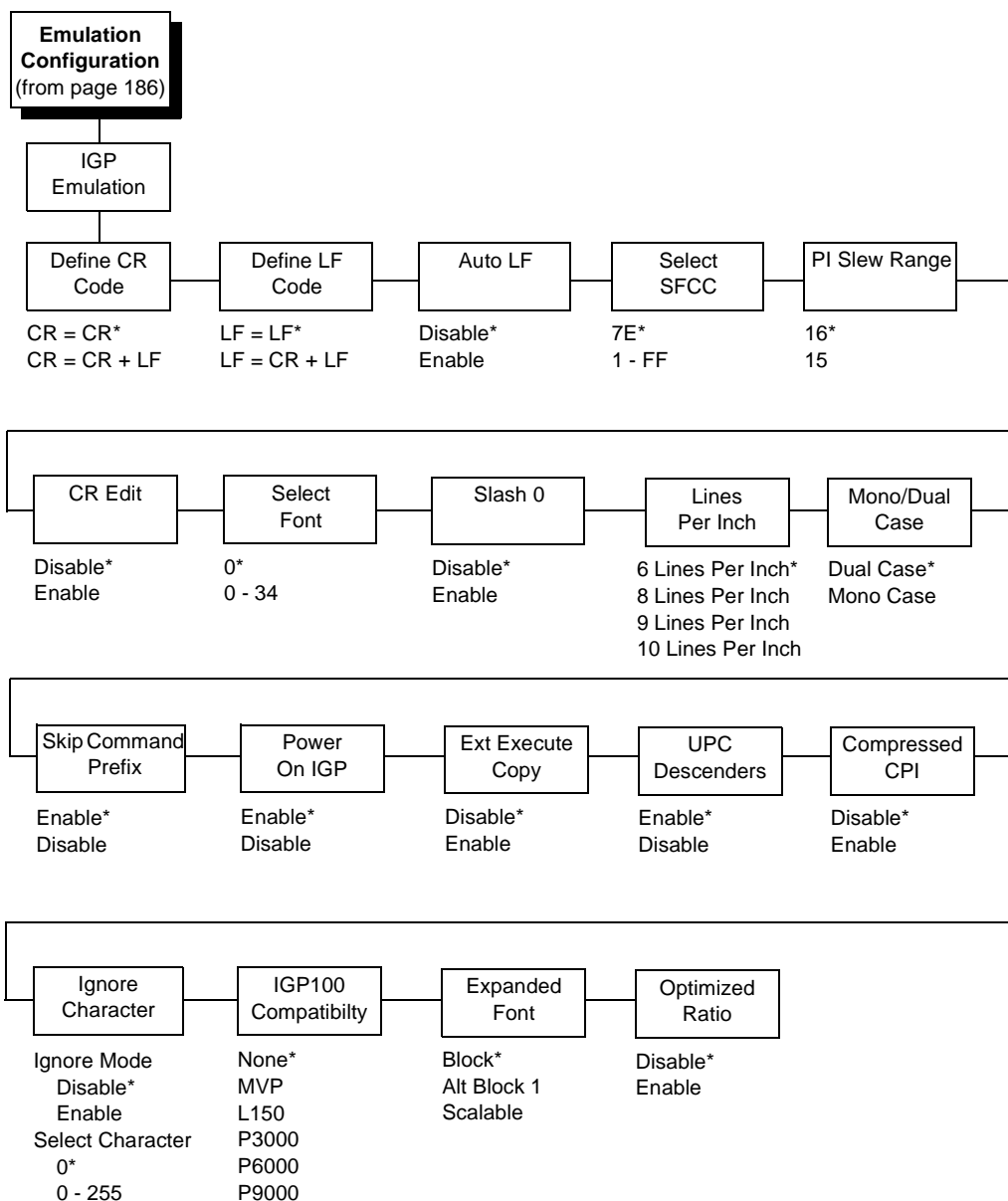
```
┌─────────────────┐
│   Emulation     │
│ Configuration   │
│ (from page 186) │
└─────────────────┘
        │
┌─────────────┐
│    IGP      │
│  Emulation  │
└─────────────┘
        │
```

Define CR Code	Define LF Code	Auto LF	Select SFCC	PI Slew Range
CR = CR*	LF = LF*	Disable*	7E*	16*
CR = CR + LF	LF = CR + LF	Enable	1 - FF	15

CR Edit	Select Font	Slash 0	Lines Per Inch	Mono/Dual Case
Disable*	0*	Disable*	6 Lines Per Inch*	Dual Case*
Enable	0 - 34	Enable	8 Lines Per Inch	Mono Case
			9 Lines Per Inch	
			10 Lines Per Inch	

Skip Command Prefix	Power On IGP	Ext Execute Copy	UPC Descenders	Compressed CPI
Enable*	Enable*	Disable*	Enable*	Disable*
Disable	Disable	Enable	Disable	Enable

Ignore Character	IGP100 Compatibilty	Expanded Font	Optimized Ratio
Ignore Mode	None*	Block*	Disable*
Disable*	MVP	Alt Block 1	Enable
Enable	L150	Scalable	
Select Character	P3000		
0*	P6000		
0 - 255	P9000		

Define CR Code (Carriage Return)

This parameter forces the printer to insert an automatic Line Feed code into the data stream whenever a Carriage Return code occurs. This is to be used only if the host computer does not send Line Feeds to the printer.

- **CR = CR** (the default). Does NOT perform a line feed. The next print position will be print position 1 of the current line.

- **CR = CR + LF**. Performs an automatic line feed. The next print position will be print position 1 of the next line.

Define LF Code (Line Feed)

This parameter forces the printer to insert an automatic Carriage Return code into the data stream whenever a Line Feed code occurs. This can be used in most installations, but it is required if the host computer does not send Carriage Returns to the printer.

• **LF = LF** (the default). Does not perform an automatic carriage return. The next print position will be the current print position of the next line.

• **LF = CR + LF**. Performs an automatic carriage return. The next print position will be print position 1 of the next line.

Auto LF

This parameter determines if text will wrap to the next line when the line of text exceeds the right margin.

• **Disable** (the default). Truncates the text beyond the right margin until a CR or CR + LF is received.

• **Enable**. Automatically inserts a CR + LF after a full print line.

Select SFCC

You can specify which hex code (1-FF) will be used as the Special Function Control Character (SFCC). The SFCC denotes that the following data is an IGP command.

• **7E** (the default)

• **1 – FF**

PI Slew Range

You can specify how many lines the paper will feed.

• **16** (the default). A paper slew of 0-15 will move 1-16 lines.

• **15**. A paper slew of 1-15 will move 1-15 lines. A paper slew of 0 will move 1 line.

CR Edit

This parameter determines if a carriage return will be followed by a line feed.

• **Disable** (the default). The printer ignores all carriage returns that are not followed by line feeds.

• **Enable**. The printer processes all carriage returns, even for those that are not followed by line feeds.

Select Font

This parameter allows you to select a font for the IGP feature. Valid selections are 0 to 33. The following predefined values are available:

0	U.S. ASCII (the default)
1	German
2	Swedish
3	Danish
4	Norwegian
5	Finnish
6	English
7	Dutch
8	French
9	Spanish
10	Italian
11	Turkish
12	Japanese
13-23	Reserved
24-31	User Defined Sets
32	0858 PC Euro Multilingual
33	0923 Latin 9 8859-15

Values 14-23 are undefined and will default to 0. You can set values 24-31 to specific fonts; refer to the USET command.

Slash 0

This option allows you to select is zeros will print with or without a slash (Ø).

- **Disable** (the default). Prints zeros without a slash (0).

- **Enable**. Prints zeros with a slash (Ø) to distinguish zeros from the alphabetical capital "O."

Lines Per Inch

This is the number of lines to be printed per inch. For example, at 6 lpi there is 1/6-inch from the top of one print line to the top of the next print line. The following number of lines per inch may be selected:

- **6** (the default)

- **8**

- **9**

- **10**

Mono/Dual Case

This parameter enables the printer to print text in all uppercase when using the ALPHA command.

- **Dual Case** (the default). The printer will print text in upper- and lowercase.

- **Mono Case**. The printer will print text in uppercase only.

Skip Command Prefix

This parameter determines if a data string before an IGP command will be ignored.

- **Enable** (the default). The printer ignores all text before an IGP command.

- **Disable**. The printer will print any data before an IGP command.

Power On IGP

You can set the IGP feature so that it is enabled or disabled when the printer is powered on.

- **Enable** (the default). The IGP is enabled when the printer is powered on. (The IGP feature is initialized in the Normal mode.)

- **Disable**. The IGP is disabled when the printer is powered on. (The IGP feature is initialized to the Quiet mode.)

Ext Execute Copy

- **Disable** (the default). Dynamic data, overlay data, etc. are not allowed if the optional Form Count parameter (number of forms to print) is specified as part of the Execute command. (This setting is IGP-100/200/400 compatible.)

- **Enable**. Dynamic data, overlay data, etc. are allowed within a form in which the Form Count parameter is specified in the Execute command. In this case, the exact same form (with identical dynamic data, etc.) is printed for whatever the Form Count is. However, incremental data is *not* incremented since the page that is printing is exactly the same. Also, each form is printed on a separate page.

UPC Descenders

This parameter determines if a gap is left for human readable data in UPC/ EAN bar codes, even if there is no human readable data. There will be no change if there is human readable data.

- **Enable** (the default). The IGP leaves a gap, even if there is no human readable data.

- **Disable**. The IGP does not leave a gap if there is no human readable data.

Compressed CPI

This parameter allows you to choose a compressed character for CPI instead of the normal height character.

- **Disable** (the default). The IGP does not use the compressed CPI font.

- **Enable**. The IGP uses the compressed CPI font.

Ignore Character

Ignore Mode

This parameter instructs the IGP to ignore the character selected under the Select Character menu.

- **Disable** (the default). The IGP does not ignore any characters.
- **Enable**. The IGP ignores the characters selected under the Selected Character menu.

Select Character

This instructs the IGP which character to ignore from the host.

- 0 (the default)
- 0 – 255

IGP100 Compatibility

This option allows backward compatibility with older printer models. If you want your new printer to emulate an older model, select from the following options:

- **None** (the default)
- **MVP**. Older printer model.
- **L150**. Older printer model.
- **P3000**. Older printer model.
- **P6000**. Older printer model.
- **P9000**. Older printer model.

Expanded Font

This option defines the type of expanded character the IGP/PGL will select. The following choices are:

- **Block** (the default). These are block characters compatible with the IGP-X00 printers.
- **Alt Block 1**. This is a customized block character set that is only available for the non-overlay multinational group of character sets.
- **Scalable**. These expanded characters have rounded edges.

Optimized Ratio

This option selects different bar code ratios for certain bar codes including Code 39 and interleaved 2 of 5. It is included for compatibility with IGP-X00 printers.

- **Disable** (the default). Use standard bar code ratios.
- **Enable**. Select the alternate bar code ratios.

Code V Feature (VGL)

Configuration

Matching printer operational settings to those of the host computer is known as printer configuration. The settings, or configuration parameters, such as selecting the host interface, are adjusted according to the configuration instructions in Chapter 3, "Configuring the Printer." Configure the Code V feature in the same way you would configure the printer for other features.

You can select Code V parameters directly from the operator panel as explained in this chapter, or by control codes as explained in the *6400 Code V Programmer's Reference Manual.*

Code V Parameters

The Code V parameters are described on the following pages. Parameters marked with an asterisk (*) indicate the default value. The printer must be off-line to enter the configuration structure.

Enter and exit the Code V configuration menu according to the steps outlined in Chapter 3, "Configuring the Printer." Pressing an invalid key to enter a parameter value may move you to another level in the configuration or exit the configuration menu completely.

IMPORTANT   **BEFORE you reconfigure the Code V, print a configuration sheet to see all of the current settings. Refer to Chapter 3, "Configuring the Printer."**

Configure the Code V according to your specific requirements.

The Code V configuration menu is shown on the following page.

Code V Emulation Menu

```
┌─────────────────┐
│ Emulation       │
│ Configuration   │
│ (from page 186) │
└─────────────────┘
        │
┌─────────────────┐
│ Code V          │
│ Emulation       │
└─────────────────┘
        │
```

SFCC and Power On	Lines Per Inch	Graphics Options	Error Handling	Character Filtering
Select SFCC	6*	See the following page.	Error Messages	Ignore Characters
5E*	7		Error Markers	Disable*
Power On ^X	8		Off Page Errors	Character 1
Disable*	9		Bar Code Errors	Character 2
Enable	10			Character 1 + 2
Power On ^F				Select Character 1
Disable*				0* - 255
Enable				Select Character 2
Power On ^PY				0* - 255
Disable*				Data Bit 8
Enable				Enable*
				Disable

Font Set	PI Control
0*	Printer PI
(0 - 33)	Disable*
	Enable
	Host PI
	Disable*
	Enable
	PI Slew Range
	Enable*
	Disable

```
           ┌──────────────┐
           │  Graphics    │
           │  Options     │
           │(from page 210)│
           └──────┬───────┘
```

Slashed Zero	Ignore Dots Value	Append Rotated	Truncate Off Page Alpha	True Vertical 1/10
Disable* Enable	Disable* Enable	Disable* Enable	Disable* Enable	Disable* Enable

Absorb at ^PY	UPC Descenders	Rotate Character Size	Ignore Spaces	Midline PY	Dark Barcode
Absorb Motion* Disable Absorb All	Enable* Disable	Adjusted* Not Adjusted	Disable* Enable	Enable* Disable	Disable* Enable

Expanded Font	LP+ Font	Width Limit	Absorb at ^PN	IGP110 Compatibility	Inline Graphics
Block* Scalable	Disable* Enable	Disable* Enable	Disable* Enable	Enable* Disable	Disable* Enable

SFCC and Power On

Select SFCC

Selects the Special Function Control Character. Valid values are 11 (hex) through FF (hex). The default value is 5E (hex). Always use the SFCC required for your configuration wherever the circumflex, or (cc) is shown. Obtain a configuration printout to determine the currently selected SFCC.

Power On ^X

Selects the ignore mode power up condition. Refer to the *6400 Code V Programmer's Reference Manual* for more information.

• **Disable** (the default). Does not select the ignore mode as the power-up default.

• **Enable**. Selects the ignore mode as the power-up default, and selects the graphics mode (cc)PY as the power-up default. All characters are ignored until a (cc)A command is received.

211

Power On ^F

Enable Free format causes the Code V to ignore carriage returns, line feeds and all characters below 20 hex sent from the host. Refer to the *6400 Code V User's Manual* for more information on Free Format.

- **Disable** (the default). Does not select free format as the power-up default.

- **Enable**. Selects free format as the power-up default, and selects the graphics mode (cc)PY as the power-up default.

Power On ^PY

Selects the graphics mode power up condition. Refer to the *6400 Code V Programmer's Reference Manual* for more information.

- **Disable** (the default). Does not select the graphics mode (cc)PY as the power-up default.

- **Enable**. Selects the graphics mode (cc)PY as the power-up default.

Lines Per Inch

Defines the number of lines per inch for the Code V to use. Can also be set by using the ^@L command. The following number of lines per inch may be selected:

- **6** (the default)

- **7**

- **8**

- **9**

- **10**

Graphics Option

Slashed Zero

- **Disable** (the default). Prints zeros without a slash (0).

- **Enable**. Prints zeros with a slash (Ø) to distinguish zeros from the alphabetical capital "O."

Ignore Dots Value

- **Disable** (the default)

- **Enable**. Causes the Code V to expect position values to be specified in only 1/10 of an inch. If the dot position is also given, it is treated as text.

Append Rotated

- **Disable** (the default). Appends logos to an alphanumeric string rotated in a clockwise, counterclockwise, or inverted orientation.

- **Enable**. When enabled, the logo is treated as a separate element.

Truncate Off Page Alpha

When enabled, this parameter prevents the printing of Error 48 (Element Off Page Error) if alphanumeric data, including spaces, extends beyond the right side of the form.

• **Disable** (the default)

• **Enable**

True Vertical 1/10

Determines if a vertical 1/10 of an inch parameter is used as 1/10 of an inch (Enabled) or as 7/72 of an inch (Disabled). When used as 1/10 of an inch, rounding will occur to the nearest 1/72 of an inch. This can cause vertical moves that have the same value to differ by _1/72 of an inch. When used as 7/72 of an inch, the absolute move is slightly smaller than expected. For example, a one inch move would be 70/72 of an inch. Vertical moves that have the same value will be identical in length.

• **Disable** (the default).

• **Enable**

Absorb at ^PY

• **Absorb Motion** (the default). Prevents paper motion following a system terminator in a graphics (cc)PY command.

• **Disable**. When disabled, system terminators following a graphics command are sent to the printer and result in paper motion.

• **Absorb All**. When absorb all is selected, the system ignores all the data and terminator until a host generated terminator is detected.

UPC Descenders

This parameter determines if a gap is left for human readable data in UPC/ EAN bar codes, even if there is no human readable data. There will be no change if there is human readable data.

• **Enable** (the default). Leaves a gap even if there is no human readable data.

• **Disable**. Does not leave a gap if there is no human readable data.

Rotate Character Size

The Rotated Character Size option determines if rotated (clockwise/counter-clockwise), expanded characters have a different size than a non-rotated character with the same size parameters (Adjusted) or the same size (Not Adjusted).

• **Adjusted** (the default)

• **Not Adjusted**

Ignore Spaces

- **Disable** (the default). Trailing spaces are NOT deleted from alphanumeric elements in a graphics pass.

- **Enable**. Trailing spaces are deleted from alphanumeric elements in a graphics pass.

Midline PY

- **Enable** (the default). Allows printable characters to precede the ^PY command.

- **Disable**. Requires the ^PY command to be the first characters on a line.

Dark Barcode

- **Disable** (the default). Bar codes are printed in normal mode.

- **Enable**. When enabled, prints all bar codes in a dark mode.

Expanded Font

- **Block** (the default). These are block characters compatible with the IGP-X00 printers.

- **Scalable**. These expanded characters have rounded edges.

LP+ Font

- **Disable**. The IGP/VGL uses its default half-dot font, which is slightly different from the standard bitmap font used by LP+ at 12, 13, 15 and 17 cpi.

- **Enable**. The IGP/VGL uses the same font as used by LP+ at all cpi.

Width Limit

- **Disable** (the default). This does not limit the width of expanded characters.

- **Enable**. When enabled, limits the width of expanded characters based on a fixed maximum ratio of width over height.

Absorb at ^PN

- **Disable** (the default). When disabled, system terminators following the (cc)PN command are sent to the printer and result in paper motion.

- **Enable**. Prevents paper motion following the (cc)PN command.

IGP110 Compatibility

- **Enable** (the default). This menu will process ^IPEXP commands in the same manner the IGP does, and does not expand special font characters if an ^IPEXP command precedes it.

- **Disable**. If disabled, it will allow the special font characters to be expanded.

Inline Graphics

- **Disable** (the default). Requires the printer move to the beginning of the line to start a graphic.

- **Enable**. Permits Code V graphics to start in the middle of a print line as opposed to moving to the beginning of the line to start a graphic.

Error Handling

Error Messages

- **Enable** (the default). Checks command syntax and prints error messages when command parameters are incorrect.

- **Disable**. Suppresses error checking and error messages.

Error Markers

- **Enable** (the default). Prints the following error markers for those elements that print beyond the page boundaries:

  >> for elements that begin off the right side of the page;

  << for elements that begin at the indicated position but end off the page

  ⬤ for elements where the starting position of the command contains an error other than an off-page error.

- **Disable**. Does not print error markers for those elements that print beyond the page boundaries.

Off Page Errors

- **Disable** (the default). Does not report errors for elements that start or end beyond the right edge of the page.

- **Enable**. Reports errors for elements that start or end beyond the right edge of the page.

Bar Code Errors

- **Enable** (the default). Prints an error message when invalid bar code data is encountered.

- **Disable**. Does not print an error for invalid bar code data and the bar code will be printed as is.

Character Filtering

Ignore Characters

Determines if character filtering is enabled, or if one or both characters are ignored.

- **Disable** (the default). Does not ignore the characters selected with the select character options.

- **Character 1**. The character selected using the Select Character 1 option will be ignored in the data string.

- **Character 2**. The character selected using the Select Character 2 option will be ignored in the data string.

- **Character 1 and 2**. Both characters selected using the Select Character 1 and Select Character 2 options will be ignored in the data string.

Select Character 1

Selects character 1 for the character filtering option.

- **0** (the default)
- **0 – 255** (decimal)

Select Character 2

Selects character 2 for the character filtering option. Valid values are from 0 through 255 (decimal).

- **0** (the default)
- **0 – 255** (decimal)

Data Bit 8

- **Enable** (the default). The PI line is not passed directly from host to printer; all 8 bits are used for data bits, and characters in the 80-FF hex range can be accessed.

- **Disable**. When the host PI line is enabled, indicates PI line status. To use the PI line, disable data bit 8, and enable the Host PI configuration option.

NOTE: Data bit 8 is interpreted as *either* data bit 8 or PI signal, but never both. When enabled as data bit 8, data bit 8 has priority over the PI signal, and all data above 7F hex is used to access character data and not to interpret PI line data.

Conversely, when data bit 8 is disabled and the PI signal is used, data bit 8 of the data is reserved for use as the PI function, and you cannot access characters in the 80-FF hex range. Therefore, to access characters in the 80-FF hex range, data bit 8 *must* be enabled.

Font Set

This parameter allows you to select a font for the Code V feature. Valid selections are 0 to 32. The following predefined values are available:

- **0**   **U.S. ASCII** (the default)
- **1**   **German**
- **2**   **Swedish**
- **3**   **Danish**
- **4**   **Norwegian**
- **5**   **Finnish**
- **6**   **English**
- **7**   **Dutch**
- **8**   **French**
- **9**   **Spanish**
- **10**   **Italian**
- **11**   **Turkish**
- **12**   **Japanese**
- **13-23**   **Reserved**
- **24-31**   **User Defined Sets**
- **32**   **0858 PC Euro Multilingual**
- **33**   **0923 Latin 9 8859-15 Euro**

PI Control

Printer PI

- **Disable** (the default). Does not inform the Code V that the ASCII emulation is configured with the PI line enabled.

- **Enable**. Informs the Code V that the ASCII emulation is configured with the PI line enabled.

Host PI

- **Disable** (the default). The Data Bit 8 configuration option must be disabled to transmit the PI line to the printer.

- **Enable**. Informs the Code V that the host sends PI signals.

PI Slew Range

You can specify how many lines the paper will feed.

- **Enable** (the default). A paper slew of 0-15 will move 1-16 lines.

- **Disable**. A paper slew of 1-15 will move 1-15 lines. A paper slew of 0 will move 1 line.

Printer Emulation Configuration Menu
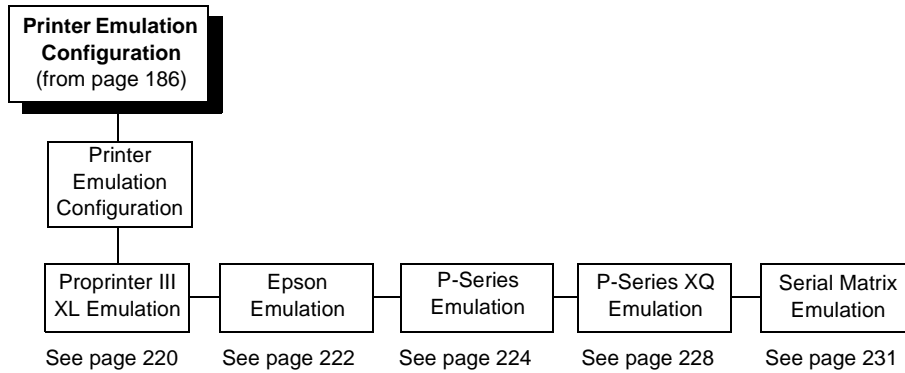
**Printer Emulation
Configuration**
(from page 186)

Printer
Emulation
Configuration

Proprinter III XL Emulation	Epson Emulation	P-Series Emulation	P-Series XQ Emulation	Serial Matrix Emulation
See page 220	See page 222	See page 224	See page 228	See page 231

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

Proprinter III XL Emulation Menu

```
Proprinter III XL
   Emulation
 (from page 219)
```

Print Language	Alternate Character Set	Define CR Code	Auto LF	Define LF Code

0437 PC Character Set*   PC Character Set 2*   CR = CR*   Enable*   LF = LF*
0737 Greek   PC Character Set 1   CR = CR + LF   Disable   LF = CR + LF
0813 Greek Euro
0819 ISO/ANSI Multilingual
0850 PC Multilingual
0851 Greek Old
0852 Latin 2/Roece
0853 Latin 3 PC
0855 Cyrillic
0857 Turkish
0858 PC Euro Multilingual
0860 Portuguese
0861 Icelandic
0862 Hebrew
0863 Canadian French
0864 Arabic
0865 Danish/Norwegian
0866 Cyrillic
0869 Greek New Euro
0874 Thai
0876 ORC A
0877 ORC B
0912 ISO Latin 2 PC
0913 ISO Latin 3
0914 ISO Latin 4
0915 ISO Cyrillic PC
0916 Hebrew
0920 ISO Latin 5 Turkish
0921 ISO Baltic Multilingual
0922 Estonian
0923 Latin 9 8859-15
1006 ISO URDU
1008 ISO Arabic
1046 Arabic Extended
1089 ISO Arabic
1098 Farsi 1285
1116 Estonian
1117 Latvian
1118 Lithuanian
1129 Vietnamese
1134 Hebrew Old
DEC Greek

FF Valid at TOF	20 CPI Condensed
Enable*	Enable*
Disable	Disable

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter

To select an option, press:

To exit the configuration menus
and return to READY, press: Start

* = Factory Default

Print Language

Print language specifies the set of print languages used by the printer. Refer to the previous page for print language menus.

Alternate Character Set

The alternate character set code can be used to mix primary and alternate characters on a single line. The main character set is automatically selected when a line terminator code is received.

- **PC Character Set 2** (the default). Selects 80-9F hex in the character as printable.

- **PC Character Set 1**. Selects 80-9F hex in the character as control codes.

Define CR Code (Carriage Return)

This parameter forces the printer to insert an automatic Line Feed code into the data stream whenever a Carriage Return code occurs. This is to be used only if the host computer does not send Line Feeds to the printer.

- **CR = CR** (the default). Does NOT perform a line feed. The next print position will be print position 1 of the current line.

- **CR = CR + LF**. Performs an automatic line feed. The next print position will be print position 1 of the next line.

Auto LF

This parameter determines if text will wrap to the next line when the line of text exceeds the right margin.

- **Enable** (the default). Automatically inserts a CR + LF after a full print line.

- **Disable**. Truncates the text beyond the right margin until a CR or CR + LF is received.

Define LF Code (Line Feed)

This parameter forces the printer to insert an automatic Carriage Return code into the data stream whenever a Line Feed code occurs. This can be used in most installations, but it is required if the host computer does not send Carriage Returns to the printer.

- **LF = LF** (the default). Does not perform an automatic carriage return. The next print position will be the current print position of the next line.

- **LF = CR + LF**. Performs an automatic carriage return. The next print position will be print position 1 of the next line.

FF Valid At TOF

- **Enable** (the default). Performs a form feed when the host sends a Form Feed command and the printer is at the top of form.

- **Disable**. Will not perform a form feed when the host sends a Form Feed command and the printer is at the top of form.

20 CPI Condensed

Compressed print characters are narrower than the normal character set. This is helpful for applications where you need to print the maximum amount of information on a page.

• **Enable** (the default). Prints characters about 60 percent the width of normal characters when compressed print is chosen by the host computer.

• **Disable**. Does not compress print widths, even if condensed print is chosen by the host.

Epson Emulation Menu

```
┌─────────────┐
│   Epson     │
│  Emulation  │
│(from page 219)│
└─────────────┘
```

Character Sets	Epson Print Language	Define CR Code	Auto LF

Epson Set*
OCR A
OCR B
0437 PC Character Set
0737 Greek
0813 Greek Euro
0819 ISO/ANSI Multilingual
0850 PC Multilingual
0851 Greek Old
0852 Latin 2/Roece
0853 Latin 3 PC
0855 Cyrillic
0857 Turkish
0858 PC Euro Multilingual
0860 Portuguese
0861 Icelandic
0862 Hebrew
0863 Canadian French
0864 Arabic
0865 Danish/Norwegian
0866 Cyrillic
0869 Greek New Euro
0874 Thai
0912 ISO Latin 2 PC
0913 ISO Latin 3
0914 ISO Latin 4
0915 ISO Cyrillic PC
0916 Hebrew
0920 ISO Latin 5 Turkish
0921 ISO Baltic Multilingual
0922 Estonian
0923 Latin 9 8895-15
1006 ISO URDU
1008 ISO Arabic
1046 Arabic Extended
1089 ISO Arabic
1098 Farsi 1285
1116 Estonian
1117 Latvian
1118 Lithuanian
1129 Vietnamese
1134 Hebrew Old
DEC Greek

ASCII (USA)*
French
German
English (UK)
Danish I
Swedish
Italian
Spanish I
Japanese
Norwegian
Danish II
Spanish II
Latin American I
French Canadian
Latin American II

CR = CR*
CR = CR + LF

Enable*
Disable

Define LF Code	Printer Select	20 CPI Condensed

LF = LF*
LF = CR + LF

Disable*
Enable

Enable*
Disable

```
┌──────────────────────────────────┐
│ To view options, press:          │
│                                  │
│ Scroll↑  Scroll↓  **Enter**  Return │
│ ┌────┐  ┌────┐  ┌────┐  ┌────┐    │
│ └────┘  └────┘  └────┘  └────┘    │
│                          **Enter** │
│ To select an option, press: ┌────┐│
│                             └────┘│
│ To exit the configuration menus  │
│ and return to READY, press:  Start│
│                          ┌────┐   │
│                          └────┘   │
│ * = Factory Default              │
└──────────────────────────────────┘
```

Character Sets

This parameter selects a character set for the Epson emulation, as shown in the "Epson Emulation Menu" on page 222. To use one of these sets, choose the desired group heading (such as 0862 Hebrew) and press ENTER. Character sets are shown in detail in the *Character Sets Reference Manual*.

Epson Print Language

Epson print language specifies the set of print languages used by the printer. Refer to the previous page for print language menus.

Define CR Code (Carriage Return)

The Define CR Code option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a carriage return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends line feeds to the printer.

- **CR = CR** (the default). Does not insert an extra line feed after each carriage return.

- **CR = CR + LF**. Inserts an extra line feed after each carriage return.

Auto LF

This option defines the printer actions when print data is received past the forms width setting.

- **Enable** (the default). Performs an automatic carriage return and line feed when data is received past the forms width.

- **Disable**. Discards any data past the forms width.

Define LF Code (Line Feed)

The Define LF Code option controls the action of the printer when it receives a Line Feed code (hex 0A) from the host computer. If this feature is enabled, each time the printer receives a Line Feed, it inserts an additional Carriage Return code (hex 0D) into the data stream. This feature is required if the host computer does not send carriage returns to the printer.

- **LF = LF** (the default). Does not add a carriage return with a line feed.

- **LF = CR + LF**. Adds an extra carriage return with each line feed.

Printer Select

- **Disable**. (the default.) Ignores the ASCII DC1 and DC3 control codes.

- **Enable**. Disables the printer when a DC1 control code is received, and enables the printer when a DC3 control code is received.

20 CPI Condensed

Compressed print characters are narrower than the normal character set. This is helpful for applications where you need to print the maximum amount of information on a page.

- **Enable** (the default). Prints about 60 percent of the width of normal characters when compressed print is chosen by the host computer. For example, a 12 CPI Draft font will compress to 20 CPI.

- **Disable**. Does not compress print widths, even if condensed print is chosen by the host.

P-Series Emulation Menu

```
┌─────────────┐
│  P-Series   │
│  Emulation  │
│(from page 219)│
└─────────────┘
```

Character Sets	Print Language	Control Code 06	Control Code 08	Define CR Code
IBM PC* Multinational EMCA Latin 1 DEC Multinational ORC A ORC B 0858 PC Euro Multilingual 0862 Hebrew 0923 Latin 9 8859-15 DEC Greek	See the following page.	8.0 LPI* 10.3 LPI 6.0 LPI	Elongated* Backspace	CR = CR* CR = CR + LF

Auto LF	Overstrike	Define LF Code	Select SFCC	EVFU Select
Disable* Enable	Enable* Disable	LF = CR + LF* LF = LF	1* 00 - 7F	Enable* Disable

Alternate Set 80 - 9F
Control Code* Printable

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus and return to READY, press: Start

* = Factory Default

```
┌─────────────┐
│    Print    │
│  Language   │
│(from page 224)│
└─────────────┘
```

IBM PC
    Select Subset Primary
        ASCII (USA)*
        French
        German
        English (UK)
        Danish
        Swedish
        Italian
        Spanish
        Japanese
        French Canadian
        Latin American
        Danish II
        Spanish II
        Latin American II
    Select Subset Extended
        0437 PC Character Set*
        0850 PC Multilingual
Multinational
    ASCII (USA)*
    EBCDIC
EMCA Latin 1
    Select Subset Primary
        ASCII (USA)*
        German
        Swedish
        Danish
        Norwegian
        Finnish
        English (UK)
        Dutch
        French
        Spanish
        Italian
        Turkish
        Japanese
    Select Subset Extended
        Multinational*
        Barcode 10 CPI
        Multinational DP 10 CPI
        Multinational DP 12 CPI
        Multinational NLQ 10 CPI
        Greek DP 10 CPI
        Greek DP 12 CPI
        Graphic DP 10 CPI
        Graphic NLQ 10 CPI
        Scientific DP 10 CPI
        Scientific DP 12 CPI
        Scientific NLQ 10 CPI
DEC Multinational
    ASCII (USA)*
    French
    German
    English (UK)
    Norwegian/Danish
    Swedish
    Italian
    Spanish
    Japanese
    French Canadian
    Dutch
    Finnish
    Swiss

Character Sets

Specifies a character set as shown in the "P-Series Emulation Menu" on page 224. To use one of these sets, choose the desired group heading (such as 0862 Hebrew) and press ENTER. Character sets are shown in detail in the *Character Sets Reference Manual.*

Print Language

Print language specifies the set of print languages used by the printer. Refer to the previous page for print language meus.

Control Code 06

Control Code 06 defines the function of ASCII code hex 06 (ACK). You can select an alternate line spacing of:

- **8.0 LPI** (the default)
- **10.3 LPI**
- **6.0 LPI**

Control Code 08

Control Code 08 defines the function of ASCII code hex 08 (BS). You can define the code to output the following character:

- **Elongated** (the default)
- **Backspace**

Define CR Code (Carriage Return)

This option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a carriage return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends Line feeds to the printer.

- **CR = CR** (the default). Does not insert an extra line feed after each carriage return.
- **CR = CR + LF**. Inserts an extra line feed after each carriage return. The next print position will be print position 1 of the next line.

Auto LF

This option defines the printer action when print data is received past the forms width setting.

- **Disable** (the default). Discards any data past the forms width.
- **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width, causing the excess text to print on the next line.

Overstrike

This option enables you to print bold characters.

- **Enable** (the default). Turns on bold print. When enabled, overstrike printing slows down the printer.

- **Disable**. Turns off bold print.

Define LF Code

- **LF = CR + LF** (the default). Forces an automatic carriage return with each line feed command. The next print position is print position 1 of the next line.

- **LF = LF**. Does not perform an automatic carriage return. The next print position will be the current print position of the next line.

Select SFCC

This parameter allows you to select which ASCII codes will function as the Special Function Control Code (SFCC) command delimiter.
P-Series codes can use hex 00 through hex 7F. Options include the following:

- **SOH (hex 01)** (the default)

- **ESC (hex 1B)**

- **ETX (hex 03)**

- **CIRCUMFLEX (hex 5E)** – also called caret (^)

- **TILDE (hex 7E)** – (~)

NOTE: SOH, ETX, and ESC are non-printables. The characters (^) and (~) are printable; however, do not use them as printables in the host data stream if either is chosen as a delimiter because print errors will occur.

EVFU Select

The EVFU SELECT (Electronic Vertical Format Unit Select) option determines if EVFU skips can be defined. An EVFU skip is an instruction to move the paper to a specific location on a form. See the *6400 ASCII Programmer's Reference Manual* for more information.

- **Enable** (the default). Defines EVFU skips.

- **Disable**. Does not define EVFU skips.

Alternate Set 80-9F

- **Control Code** (the default). Interprets data in the range of hex 80 through hex 9F as a control code.

- **Printable**. Prints data in the range of hex 80 through hex 9F.

P-Series XQ Emulation Menu
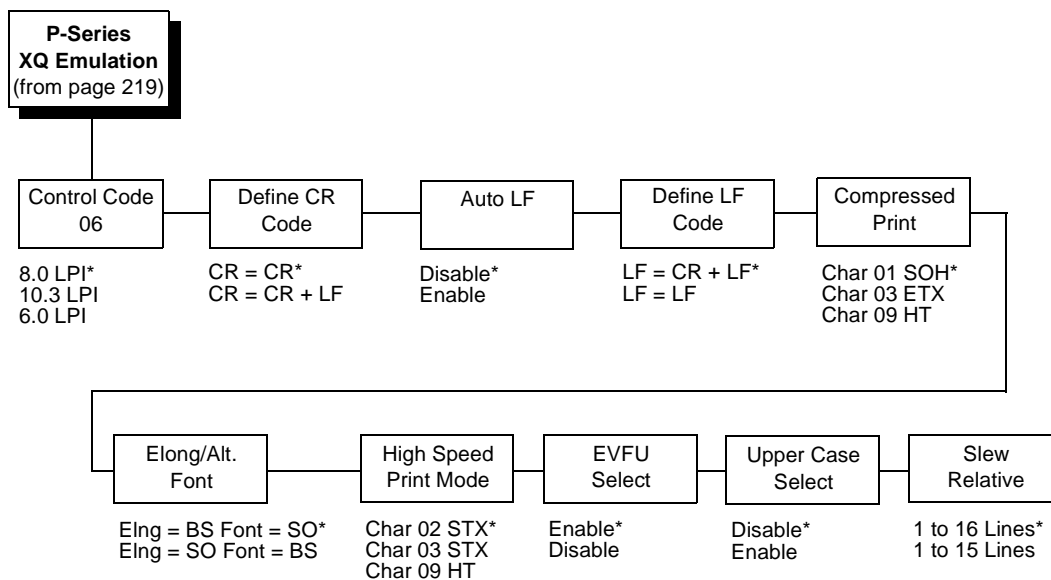
```
┌─────────────────┐
│   P-Series      │
│ XQ Emulation    │
│ (from page 219) │
└─────────────────┘
         │
```

Control Code 06	Define CR Code	Auto LF	Define LF Code	Compressed Print
8.0 LPI*	CR = CR*	Disable*	LF = CR + LF*	Char 01 SOH*
10.3 LPI	CR = CR + LF	Enable	LF = LF	Char 03 ETX
6.0 LPI				Char 09 HT

Elong/Alt. Font	High Speed Print Mode	EVFU Select	Upper Case Select	Slew Relative
Elng = BS Font = SO*	Char 02 STX*	Enable*	Disable*	1 to 16 Lines*
Elng = SO Font = BS	Char 03 STX	Disable	Enable	1 to 15 Lines
	Char 09 HT			

```
To view options, press:

Scroll↑   Scroll↓   Enter   Return
┌────┐    ┌────┐   ┌────┐
                              Enter
To select an option, press:  ┌────┐

To exit the configuration menus
and return to READY, press:  Start
                             ┌────┐

* = Factory Default
```

Control Code 06

Control Code 06 defines the function of ASCII code hex 06 (ACK). You can select an alternate line spacing of:

- **8.0 LPI** (the default)

- **10.3 LPI**

- **6.0 LPI**

Define CR Code (Carriage Return)

This option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends line feeds to the printer.

- **CR = CR** (the default). Does not insert an extra line feed after each carriage return.

- **CR = CR + LF**. Inserts an extra line feed after each carriage return. The next print position will be print position 1 of the next line.

Auto LF

This option defines the printer action when print data is received past the forms width setting.

- **Disable** (the default). Discards any data past the forms width.

- **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.

Define LF Code (Line Feed)

- **LF = CR + LF** (the default). Forces an automatic carriage return with each line feed command received. The next print position is print position 1 of the next line.

- **LF = LF**. Does not perform an automatic carriage return when a line feed command is received. The next print position will be the current print position of the next line.

Compressed Print

Controls which host command sets compressed printing.

- **Char 01 SOH** (the default)
- **Char 03 ETX**
- **Char 09 HT**

Elong/Alt. Font

Controls which host command sets elongated (double high) fonts and extended character set.

- **Elng=BS Font=SO** (the default)
- **Elng=SO Font=BS**

High Speed Print Mode

Controls which host command sets high speed printing.

- **Char 02 STX** (the default)
- **Char 03 ETX**
- **Char 09 HT**

EVFU Select

The EVFU SELECT (Electronic Vertical Format Unit Select) option determines if EVFU skips can be defined. An EVFU skip is an instruction to move the paper to a specific location on a form. See the *6400 ASCII Programmer's Reference Manual* for more information.

- **Enable** (the default) Defines EVFU skips.
- **Disable**. Does not define EVFU skips.

Upper Case Select

Controls how the printer handles lowercase characters it receives from the host computer. When enabled, all characters will be printed in uppercase.

- **Disable** (the default). Prints lowercase characters received from the host computer as lowercase, and prints uppercase characters received from the computer as uppercase.
- **Enable**. Prints lowercase characters received from the host computer as their corresponding uppercase equivalents; uppercase characters received from the computer print as uppercase.

Slew Relative

"Slewing" is rapid vertical paper movement. This parameter determines the number of lines slewed when an EVFU Slew Relative command is received.

- **1-16 Lines** (the default). Slews 1-16 lines.
- **1-15 Lines**. Slews 1-15 lines.

Serial Matrix Emulation Menu

```
┌─────────────────┐
│ Serial Matrix   │
│ Emulation       │
│ (from page 219) │
└─────────────────┘
```

Character Sets	Print Language	Control Code 06	Define CR Code
IBM PC*	IBM PC	8.0 LPI*	CR = CR*
Multinational	Select Subset Primary	10.3 LPI	CR = CR + LF
EMCA Latin 1	Select Subset Extended	6.0 LPI	
DEC Multinational	Multinational		
ORC A	ASCII (USA)*		
ORC B	EBCDIC		
0858 PC Euro Multilingual	EMCA Latin 1		
0862 Hebrew	Select Subset Primary		
0923 Latin 9 8859-15	Select Subset Extended		
DEC Greek	DEC Multinational		
	ASCII (USA)*		
	French		
	German		
	English (UK)		
	Norwegian/Danish		
	Swedish		
	Italian		
	Spanish		
	Japanese		
	French Canadian		
	Dutch		
	Finnish		
	Swiss		

Auto LF	Overstrike	Define LF Code	Printer Select	Alternate Set 80 - 9F
Enable*	Enable*	LF = LF*	Disable*	Control Code*
Disable	Disable	LF = CR + LF	Enable	Printable

```
To view options, press:

Scroll ↑   Scroll ↓   Enter   Return
┌────┐     ┌────┐     ┌────┐  ┌────┐
└────┘     └────┘     └────┘  └────┘

                              Enter
To select an option, press:  ┌────┐
                             └────┘

To exit the configuration menus
and return to READY, press:  Start
                             ┌────┐
                             └────┘

* = Factory Default
```

Character Sets

Specifies a character set as shown above. To use one of these sets, choose the desired group heading (such as 0862 Hebrew) and press ENTER. Character sets are shown in detail in the *Character Sets Reference Manual*.

- **IBM PC** (the default)
- **Multinational**
- **EMCA Latin 1**
- **DEC Multinational**
- **ORC A**
- **ORC B**
- **0858 PC Euro Multilingual**
- **0862 Hebrew**
- **0923 Latin 9 8859-15**
- **DEC Greek**

Print Language

Print language specifies the set of print languages used by the printer.

- **IBM PC** (the default)
- **Multinational**
- **EMCA Latin 1**
- **DEC Multinational**

Control Code 06

Control Code 06 defines the function of ASCII code hex 06 (ACK).

- **8.0 LPI** (the default)
- **10.3 LPI**
- **6.0 LPI**

Define CR Code (Carriage Return)

This option controls the action of the printer when it receives a Carriage Return code (hex 0D) from the host computer. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (hex 0A) into the data stream. Do not use this feature if the host computer sends line feeds to the printer.

- **CR = CR** (the default). Does not insert an extra line feed after each carriage return.

- **CR = CR + LF**. Inserts an extra line feed after each carriage return. The next print position will be print position 1 of the next line.

Auto LF

The Auto LF option defines the printer action when print data is received past the forms width setting.

- **Enable** (the default). Performs an automatic carriage return and line feed when data is received past the forms width.

- **Disable**. Discards any data past the forms width.

Overstrike

This option enables you to print bold characters.

- **Enable** (the default). Turns on bold print. When enabled, overstrike printing slows down the printer.

- **Disable**. Turns off bold print.

Define LF Code (Line Feed)

- **LF = LF** (the default). Does not perform an automatic carriage return when a line feed command is received. The next print position will be the current print position of the next line.

- **LF = CR + LF**. Forces an automatic carriage return with each line feed command received. The next print position is print position 1 of the next line.

Printer Select

- **Disable** (the default). Ignores the ASCII DC1 and DC3 control codes.

- **Enable**. Disables the printer when a DC1 control code is received, and enables the printer when a DC3 control code is received.

Alternate Set 80-9F

- **Control Code** (the default). Interprets data in the range of hex 80 through hex 9F as a control code.

- **Printable**. Prints data in the range of hex 80 through hex 9F.

Print Format Menu

Print Format
(from page 186)

Print Format

Characters Per Inch	Lines Per Inch	Forms Width	Forms Length
10.0 Characters Per Inch*	6.0 Lines Per Inch*	Forms Width in Inches [1]	Forms Length in Inches [1]
12.0 Characters Per Inch	8.0 Lines Per Inch	13.6 Inches*	11.0 Inches*
13.3 Characters Per Inch	10.3 Lines Per Inch [3]	00.1 - 13.6 Inches	00.1 - 24 Inches
15.0 Characters Per Inch	3.0 Lines Per Inch	Forms Width in MM [1]	Forms Length in MM [1]
16.7 Characters Per Inch	4.0 Lines Per Inch	345.4 MM*	279.4 MM*
17.1 Characters Per Inch [3]		.1 - 345.4 MM	000.1 - 609.6 MM
18.0 Characters Per Inch		Forms Width in Characters	Forms Length in Lines
20.0 Characters Per Inch [3]		132 Characters* [2]	66 Lines*
		1 - 272 Characters	1 - 192 Characters

Print Quality	Print Character Table	Print Attributes	Margins	Perforation Skip[1]
DP Quality*		Proportional Spacing	Left Margin [1]	Disable*
Near Letter Quality		Disable*	0 Characters*	1/2 Inch
OCR A [3]		Enable	1 - 369 Characters	2/3 Inch
OCR B [3]		Italic Print	Right Margin [1]	5/6 Inch
Draft		Disable*	0 Characters*	1 inch
NLQ San Serif [3]		Forward Slant	1 - 369 Characters	
		Backward Slant	Bottom Margin	
		Slashed Zero	0 Lines*	
		Disable*	1 - 451 Lines	
		Enable		
		Text Position		
		Bottom of Line*		
		Top of Line		

Reset Command

Load Factory*
Load Power On

NOTE:
[1] These variables are not available with the Coax/Twinax emulation selected.
[2] To select forms width in characters greater than 136 characters for coax/twinax, you must first change maximum printable width to 13.6 inches.
[3] Does not apply to IPDS.

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return

Enter
To select an option, press:

To exit the configuration menus and return to READY, press: Start

* = Factory Default

Characters Per Inch

CHARACTERS PER INCH (CPI) specifies the number of characters that will print per horizontal inch.

- **10.0 Characters Per Inch** (the default)
- **12.0 Characters Per Inch**
- **13.3 Characters Per Inch**
- **15.0 Characters Per Inch**
- **16.7 Characters Per Inch**
- **17.1 Characters Per Inch**
- **18.0 Characters Per Inch**
- **20.0 Characters Per Inch**

It is possible to specify a CPI value that causes the page width to exceed the maximum physical page width. In this case, the printer automatically changes the page width to the highest valid value for the new CPI.

When OCR A or OCR B is selected as the default print language, 10 CPI is the only available value for this parameter. If a different CPI value is desired, the print language must be changed first.

NOTE: Receipt of a data stream control code that specifies a CPI value overrides any value entered via the operator panel.

Lines Per Inch

LINES PER INCH (LPI) specifies the number of lines that will print per vertical inch.

- **6.0 Lines Per Inch** (the default)
- **8.0 Lines Per Inch**
- **10.3 Lines Per Inch**
- **3.0 Lines Per Inch**
- **4.0 Lines Per Inch**

It is possible to specify an LPI value that causes the page length to exceed the maximum allowed page length. In this case, the printer automatically changes the page length to the highest valid value for the new LPI.

NOTE: Receipt of a data stream control that specifies the LPI value overrides the value entered via the operator panel.

Forms Width

FORMS WIDTH specifies the forms width in inches, millimeters or characters. All three measurements will update the same configuration parameter. The default values for forms width are 13.6 inches, 345.4 mm and 136 characters.

NOTE: The default values for forms width are 13.2 inches, 335.5 mm and 132 characters when P-Series, Coax/Twinax, IGP, Code V, or IPDS are installed.

FORMS WIDTH IN INCHES and FORMS WIDTH IN MM selections are not available with the Coax/Twinax or IPDS emulation. The only variable available with the Coax/Twinax and IPDS emulation is FORMS WIDTH IN CHARACTERS.

Descriptions follow for the three ways of specifying the forms width:

Forms Width In Inches

Allows you to input the forms width in inches. Valid values range from 00.1 through 13.6 inches, in increments of 0.1 inch.

Forms Width In MM

Allows you to input the forms width in millimeters. Valid values range from .1 through 345.4, in increments of tenths of a millimeter (0.1 mm).

Forms Width In Characters

Allows you to input the forms width in characters. The maximum forms width in characters depends on the current CPI setting; it is equal to the maximum forms width in inches multiplied by the current CPI setting.

For example, at 10 CPI, the maximum forms width is:

10 CPI x 13.6 inches = 136 characters.

Only valid forms width values will be accepted. If a width is selected that is larger than the maximum width for the current CPI, then the maximum width will be used. If a larger width value is desired, then the CPI value must be changed first.

NOTE: To select forms width in characters greater than 132 characters for coax/twinax, you must first change maximum printable width to 13.6 inches.

Receipt of a data stream control code that changes the page width overrides the page width previously specified via the operator panel.

The following table lists the maximum number of characters that can be printed for a given Characters Per Inch (CPI) setting.

CPI Setting	Maximum Forms Width (in Characters)
10.0	136*
12.0	163
13.3	181
15.0	204
16.7	227
17.1	232
18.0	245
20.0	272
* = Default	

IMPORTANT   **If the forms width is set in characters and the CPI is changed, the effective page width is changed to be equal to the forms width in characters divided by the new CPI. For example, if the current forms width is 132 characters and the CPI is changed from 10 CPI to 15 CPI, the effective forms width changes from 13.2 inches to 8.8 inches.**

NOTE: This applies only if the forms width is set in characters. If the forms width is set in inches or millimeters (mm), changing the CPI does not affect the effective forms width.

Forms Length

FORMS LENGTH specifies the forms length in inches, millimeters or lines. All three measurements will update the same configuration parameter. The default values for forms length are 11 inches, 279.4 millimeters, or 66 lines per page.

Descriptions follow for the three ways of specifying the forms length:

NOTE: The actual value displayed for forms length set in inches and mm can be greater than the maximum values listed on the operator panel because the number of lines can exceed actual inches and mm values.

FORMS LENGTH IN INCHES and FORMS LENGTH IN MM selections are not available with the Coax/Twinax or IPDS emulations. The only variable available with the Coax/Twinax and IPDS emulations is FORMS LENGTH IN LINES.

Forms Length In Inches

Allows you to input the forms length in inches. Valid values range from 00.1 through 24 inches, in increments of 0.1 inch. (This option not available for the coax interface.)

Forms Length In MM

Allows you to input the forms length in millimeters. Valid values range from 000.1 through 609.6 millimeters, in increments of tenths of a millimeter (0.1 mm). (This option not available for the coax interface.)

Forms Length In Lines

Allows you to input the forms length in lines. The maximum forms length in lines depends on the current LPI setting; it is equal to the maximum forms length in inches multiplied by the current LPI setting.

For example, at 6 LPI the maximum forms length is:

6 LPI x 24 inches = 144 lines

Only valid forms length values will be accepted. If you select a length that is larger than the maximum length for the current LPI, the maximum length will be used. If you need a longer page length, you must first change the LPI.

IMPORTANT **If the forms length is set in lines and you change the LPI, the effective page length changes to the forms length in characters divided by the new LPI. For example, if the current forms length is 66 lines and you change the LPI from 6 LPI to 8 LPI, then the effective forms length changes from 11 inches to 8.25 inches.**

NOTE: This only applies if the forms length is set in lines. If the forms length is set in inches or millimeters, changing the LPI does not affect the effective forms length.

Receipt of a data stream control code which changes the forms length overrides the forms length previously specified via the operator panel.

Print Quality

NOTE: When using bold or emphasized printing, the printer prints two dots instead of one to produce the desired effect. This does not affect characters per inch.

This parameter specifies the density (quality) of printing:

- **DP Quality** (the default)

- **Near Letter Quality**

- **OCR A**

- **OCR B**

- **Draft**

- **NLQ Sans Serif**

NOTE: Receipt of a data stream control sequence that changes the print quality overrides the print quality specified via the operator panel.

Specifying a print *quality* of OCR A or OCR B will change the print *language* to OCR A or OCR B.

When OCR A or OCR B is selected as the default print language, OCR A/ OCR B are the only available values for this parameter. If a different print quality value is desired, the print language must be changed first.

Print Character Table

This parameter prints out a table of the current interface character set.

Print Attributes

The PRINT ATTRIBUTES parameter is used to determine character and page formatting.

Proportional Spacing

Uses proportional spacing for text data when enabled.

- **Disable** (the default)

- **Enable**. Uses proportional spacing for text data.

NOTE: Proportional spacing is only supported in 10 CPI. Therefore, you must select 10 CPI, or proportional spacing will be ignored.

Italic Print

Prints text in italics, when enabled. Both a forward and backwards slanting italic are available.

- **Disable** (the default)

- **Forward Slant**. Uses italic print that slants forward.

- **Backward Slant**. Uses italic print that slants backward.

Slashed Zero

Prints zeros with a slash, when enabled, to distinguish zeros from the alphabetic capital "O."

- **Disable** (the default)
- **Enable**. Prints zeros with a slash.

Text Position

Specifies where the text will be positioned in the line space. When set to Top of Line, text will be positioned at the top of the line space. When set to Bottom of Line, the text will be positioned as if it were at the bottom of a 6 lpi line space.

- **Bottom of Line** (the default)
- **Top of Line**

The following example shows both Top of Line and Bottom of Line text positions for a 6 LPI line spacing:
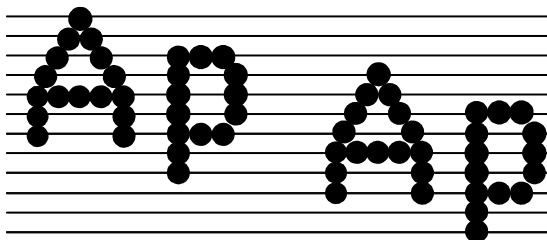
Margins

NOTE: LEFT MARGIN and RIGHT MARGIN selections are not available with the Coax/Twinax emulation. The only variable available with the Coax/Twinax emulation is BOTTOM MARGIN.

The MARGINS parameter defines where the bottom, left, and right page margins are located.

Left Margin

Defines where print position 1 is located. The left margin is specified as the number of characters from the left edge of the forms. Valid values range from the following:

- **0 Characters** (the default)
- **0 – 369 Characters**.

Right Margin

Defines where the last print position is located. The right margin is specified as the number of characters from the right edge of the forms. Valid values range from the following:

- **0 Characters** (the default)

- **0 – 369 Characters**

Bottom Margin

Defines the location of the last print line on the page. The bottom margin is specified as the number of lines from the bottom of forms position. Valid values range from the following:

- **0 Lines** (the default)

- **0 – 451 Lines**

Perforation Skip

- **Disable** (the default). Allows printing on page perforation.

- **1/2 inch**. Allows you to set up a skip-over margin of 1/2 inch. For example, a skip-over margin of 1/2 inch allows a 1/2 inch margin at the bottom of the page.

- **2/3 inch**. Allows you to set up a skip-over margin of 2/3 inch.

- **5/6 inch**. Allows you to set up a skip-over margin of 5/6 inch.

- **1 inch**. Allows you to set up a skip-over margin of 1 inch.

Reset Command

Reset Command specifies the configuration that will be used by the printer after the reset command is issued.

- **Load Factory** (the default). Loads the factory default configuration for printer use. This is the default selection.

- **Load Power On**. Loads the selected power on configuration for printer use.

Operator Print Tests Menu

```
┌──────────────┐
│ Operator Print│
│    Tests      │
│ (from page 104)│
└──────────────┘
         │
  ┌────────────┬────────────┬────────────┬────────────┐
  │  Printer   │ Print Error│   Ripple   │   All E's   │
  │Demonstration│    Log     │   Print    │             │
  └────────────┴────────────┴────────────┴────────────┘

  ┌────────────┬────────────┬────────────┬────────────┬────────────┐
  │   All H's   │ All E's + FF│  Underlines │ Adapter Test│Ethernet Test│
  │             │            │             │  Page (1)   │  Page (2)   │
  └────────────┴────────────┴────────────┴────────────┴────────────┘
```

To view options, press:

Scroll ↑   Scroll ↓   **Enter**   Return
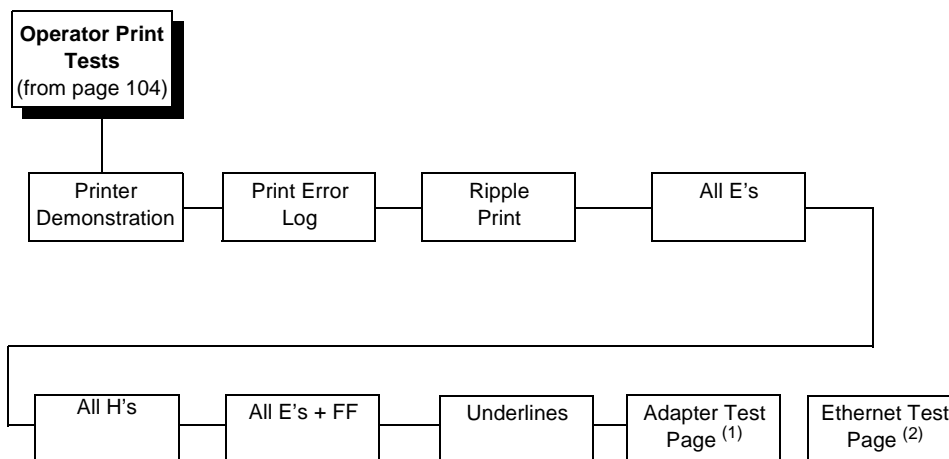
Enter

NOTE:
(1) The Adapter Test Page is only available with the Ethernet Adapter feature installed.
(2) The Ethernet Test Page is only available with the Integrated Ethernet feature installed.

To select an option, press: **Enter**

To exit the configuration menus and return to READY, press: Start

* = Factory Default

The print tests are used to check the print quality and operation of your printer. The procedure to run these tests is shown on page . The self–tests include the following:

Printer Demonstration

(The default). 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.

Adapter Test Page

Prints an Ethernet Adapter configuration page. If the Ethernet Adapter is not properly installed, this page will not print.

NOTE: This page contains important system and ethernet adapter information and should be maintained with your system configuration printout.

Your IBM Customer Service Representative will typically run these tests.

Ethernet Test Page

Prints an Ethernet configuration page. If the Integrated Ethernet is not properly installed, this page will not print.

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

Your IBM Customer Service Representative will typically run these tests.

Printer Information Menu

```
         ┌─────────────┐
         │  Printer    │
         │ Information │
         │(from page 104)│
         └──────┬──────┘
                │
    ┌───────────┼────────────────┐
┌───┴────┐  ┌───┴────┐  ┌────────┴────┐
│Installed│ │Power On│  │Printing Time│
│ Memory  │ │  Time  │  │             │
└────────┘  └────────┘  └─────────────┘

┌──────────┐  ┌──────────────┐
│Print Strokes│ │11 Inch Pages│
└──────────┘  └──────────────┘
```

```
┌─────────────────────────────────────┐
│ To view options, press:              │
│                                      │
│  Scroll ↑  Scroll ↓  **Enter**  Return │
│  ┌────┐    ┌────┐   ┌────┐  ┌────┐   │
│                                      │
│                            **Enter**  │
│ To select an option, press: ┌────┐   │
│                                      │
│ To exit the configuration menus      │
│ and return to READY, press:  Start   │
│                              ┌────┐   │
│ * = Factory Default                  │
└─────────────────────────────────────┘
```
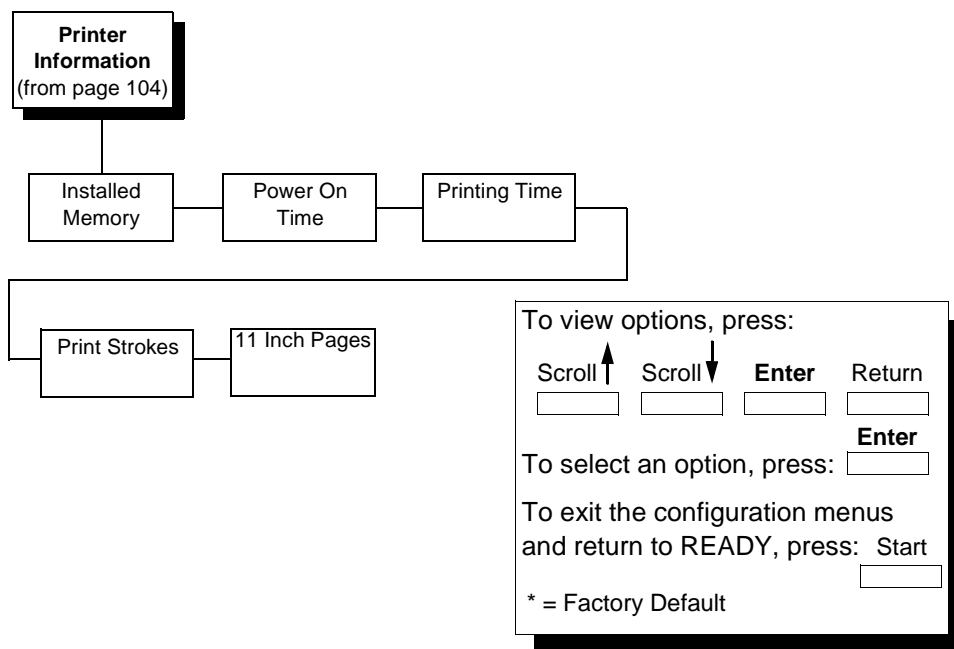
You can view various printer statistics, such as hours of usage, and refer to these figures for preventive maintenance purposes. Printer statistics accumulate continuously; they do not reset when you power off the printer.

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
(from page 104)
```

New Ribbon XXX%	Ribbon Action	Ribbon Type	Ribbon End Point	New Ribbon Detect

Press the ENTER key to reset ribbon life to 100%.

Disable*
Display
Fault Immediate
Fault Paper Out

6400-I Premium 30 Ribbon*
6400-I Premium 20
6400-I Premium 2000

Normal*
Reduce 5% - 100%
Extend 5% - 100%

Disable*
Enable

```
To view options, press:

   Scroll ↑   Scroll ↓   Enter   Return

                                    Enter
To select an option, press:

To exit the configuration menus
and return to READY, press:  Start

* = Factory Default
```

New Ribbon

This provides a means to manually set the printer when a new ribbon has been installed. The ribbon life displayed on the control panel (if active) sets to 100%. The count internal to the printer also resets, and the tabulation towards end of ribbon life begins.

Ribbon Action

- **Disable** (the default). When Disable mode is selected, the ribbon life display is removed from the control panel, but the Ribbon Minder continues to monitor ink consumption. No indication (no flashing light, or warning beep) is given, and the printer continues to accept new print jobs indefinitely.

- **Display**. When DISPLAY is selected, the ribbon ink consumption will continually display on the control panel, decrementing as ink is consumed. When the ribbon life reaches 0%, the message RIBBON INK OUT/CHANGE RIBBON displays on the control panel, but the printer continues to accept new print jobs. No other indication (no flashing light, or warning beep) is given. Clear the display by replacing the ribbon when NEW RIBBON DETECT is enabled.

- **Fault immediate**. When FAULT IMMED. mode is selected, and the ribbon life reaches 0%, the message RIBBON INK OUT/CHANGE RIBBON displays on the control panel, and the printer stops and goes Off Line. To complete the job in progress, the user must press On Line. This allows the printer to continue printing for approximately two minutes. After two minutes, the printer goes Off Line again, the RIBBON INK OUT/ CHANGE RIBBON display appears, and the printer status indicator flashes. Clear the display by (1) replacing the ribbon when NEW RIBBON DETECT is enabled, or (2) pressing the CLEAR key on the control panel. If the CLEAR key is pressed, the message re-appears after approximately 2 minutes.

- **Fault paper out**. When FAULT PAPER OUT mode is selected, and the ribbon life reaches 5%, the printer continues to accept new print jobs until the printer runs out of paper. When an END OF FORMS/LOAD FORMS condition is cleared (paper is loaded), then the RIBBON INK LOW/ CHANGE RIBBON message appears and the printer status indicator flashes. The printer will not accept new print jobs until the ribbon is changed and the Ribbon Minder is reset to 100%.

  In this mode, the Ribbon Minder is automatically reset when a "clean hands" ribbon is installed and NEW RIBBON DETECT is enabled. If another type of ribbon is used, the User must reset the Ribbon Minder using the New Ribbon menu selection.

Ribbon Type

The factory default setting is dependent on the host printer. All printer models except the 6400-i20 and -i24 use IBM Premium 20 or Premium 30 Ribbon. The 6400-i20 and -i24 use IBM Premium 2000. The ribbon types include:

Ribbon Type
IBM Premium 30 Ribbon
IBM Premium 20 Ribbon
IBM Premium 2000

Ribbon End Point

• **Normal** (the default). This value corresponds to the character life expectancy of the installed ribbon. For example, the life of the IBM Premium 30 Ribbon is specified at 30 million DP characters. By selecting NORMAL Ribbon End Point, the Ribbon Minder tracks characters up to 30 million before declaring RIBBON INK OUT/CHANGE RIBBON.

• **Reduce 5% – 100%**. By changing this setting, the user can specify a point lower or higher at which the RIBBON INK OUT/CHANGE RIBBON message is displayed. Using the example above, if the Ribbon End Point was set to Reduce 50%, the RIBBON INK OUT/CHANGE RIBBON message would be displayed at 15 million characters.

• **Extend 5% – 100%**. If Ribbon End Point was set to Extend 50%, the message would display at 45 million characters. In this way, the user can set ribbon life to match the required print density for the application.

NOTE: The percentage of ribbon use displayed on the control panel by the Ribbon Minder Ink Consumption display tracks the consumption based on the adjusted Ribbon End Point. For example, if the Ribbon End Point is set to Reduce 50% (15 million characters for the standard ribbon), the Ribbon Minder Ink Consumption display starts at 100%, and decrements to reach 0% as 15 million characters print.

NOTE: Ribbon Ink Consumption is determined not by actual character count, but by an accumulation of a specified number of printed dots in any one of a number of pre-defined vertical zones. It is stated here as a function of characters printed for user clarity.

New Ribbon Detect

When the RIBBON INK OUT/CHANGE RIBBON message displays, and a new ribbon is installed with New Ribbon Detect enabled, the Ribbon Minder automatically resets by opening the platen. If New Ribbon Detect is set to Disable, the Ribbon Minder must be manually reset by using the New Ribbon function.

• **Enable** (the default)

• **Disable**.

5 *Printer Interfaces*

Overview

This chapter describes the host interfaces provided with the printer. 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 printer is equipped with three parallel interface protocols and two serial interface protocols. Coax and twinax interface protocols are available as optional features. Each interface is selected via the operator panel configuration menu. See Chapter 3, "Configuring the Printer."

The Ethernet interface is also an optional feature. Refer to the Ethernet Interface User's Manual for more information.

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

- Coax / Twinax
- RS-232 serial
- RS-422 serial (optional for the 6400-i24 and -i2s models)
- PC Parallel
- Dataproducts parallel
- IEEE1284
- Ethernet 10/100Base-T

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's control panel. Baud rates of 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 baud rates are available.

NOTE: If you select a baud rate that is greater than 19200, you may need to use RS-422 to prevent data loss. You may also need to increase the Buffer Size in K parameter from the default (1 Kbyte) to improve performance.

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. (A copper conductor, twisted-pair telephone cable with a shunt capacitance of 16 pF/foot [52.5 pF/meter] terminated in a 100 ohm resistive load must be used for the RS-422.)

RS-232

6400i Series Printers

Table 4. 6400i Series RS-232 Serial Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
Receive Data (RXD)	3	Transmit Data (TXD)	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				

6400-i24 and -i2s Models

Table 5. 6400-i24 and -i2s RS-232 Serial Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
Receive Data (RXD)	2	Transmit Status & Control Data (TXD)	3	Chassis/Signal Ground	5
Clear To Send (CTS)	8	Request To Send (RTS)	7		
Data Set Ready (DSR)	6	Data Terminal Ready (DTR)	4		
Data Carrier Detect (DCD)	1				

Receive Data (RXD). Serial data stream to the printer.

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.

Transmit Data (TXD). 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.

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

RS-422

6400i Series Printers

Table 6. 6400i Series RS-422 Serial Interface Connector Pin Assignments

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

6400-i24 and -i2s Models

NOTE: The RS-422 is optional for the 6400-i24 model.

Table 7. PSA3 RS-422 Serial Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
- Receive Data (-RXD)	1	- Transmit Data (-TXD)	3	Chassis/Signal Ground	5
+ Receive Data (+RXD)	6	+ Transmit Data (+TXD)	8		

+RXD, -RXD.Serial data stream differentially received by printer.

+TXD, -TXD.Differentially driven serial data stream for transmitting status and control information to the host. Subject to protocol selection.

NOTE: $\pm$**RXD** and $\pm$**TXD** 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-OF. 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. This 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 mans 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 erros are received, a line feed is added to force printing to occur.

RS-232 and RS-422 Serial Interface Configuration

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

Refer to page 250 for RS-232 and RS-422 parameter descriptions and information for 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, and the IGP feature is available, 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 and the IGP feature is available. Whenever the printer receives this character, it sends aresponse 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 detailed reliable data transfer, a maximum cable length of six feet is recommended.

Table 8. Printer PC Parallel Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
DATA LINE 1 Return	2 20	ACKNOWLEDGE Return	10 28	CHASSIS GROUND	17
DATA LINE 2 Return	3 21	ONLINE/SELECT FAULT	13 32	GROUND (GND)	16, 30
DATA LINE 3 Return	4 22	FAULT Return	32 29	(NC)	34
DATA LINE 4 Return	5 23	PAPER EMPTY Return	12 30		
DATA LINE 5 Return	6 24	BUSY Return	11 29		
DATA LINE 6 Return	7 25	NAUTO FEED	14		
DATA LINE 7 Return	8 26	NINIT (PRIME)	31		
DATA LINE 8 Return	9 27	NOT DATAPRODUCTS*	35		

Table 8. Printer PC Parallel Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	Pin	Signal	Pin	Signal	Pin
DATA STROBE Return	1 19	EXTERNAL 5 VOLTS	18		
PAPER INSTRUCTION Return	15 33	N SELECT	36		

PC Parallel Interface Signals

Data Lines 1 through 8. Provides eight standard or inverted levels from the host that specify character data, plot data, or a control 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 Centronics submenu.

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

Paper Instruction (PI). Carries a CVFU signal from the host with the same timing and polarity as the data line.

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 paper empty or paper jam fault.

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 to meet specific application requirements.

Refer to Chapter page 172 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.

Dataproducts Parallel Interface

The Dataproducts parallel interface allows the printer to operate with a 50-pin Amplimite (AMP) HDH-20 data cable connector. This adapter can be obtained as a feature on the 6400. The length of the data cable from the host computer to the printer must not exceed 40 feet (12 meters).

Table 9. Dataproducts Parallel Interface Connector Pin Assignments
(with a 50-pin AMP HDH-20 Data Cable Connector)

Input Signals		Output Signals		Miscellaneous	
Signal	Pin	Signal	Pin	Signal	Pin
DATA LINE 1	19	READY	22	CABLE VERIFY	45, 46
Return	3	Return	6		
DATA LINE 2	20	ONLINE	21	GROUND	39
Return	4	Return	5		
DATA LINE 3	1	DEMAND/DATA REQ.	23		
Return	2	Return	7		
DATA LINE 4	41	PARITY ERROR	27		
Return	40		11		
DATA LINE 5	34				
Return	18				
DATA LINE 6	43				
Return	42				
DATA LINE 7	36				
Return	35				
DATA LINE 8	28				
Return	44				
DATA STROBE	38				
Return	37				
PAPER INSTRUCTION	30				
	14				
Return					
BUFFER CLEAR	31				
Return	15				
NOTE: Pins not listed are not connected.					

Dataproducts Parallel Interface Signals

Data Lines 1 through 8. Provides eight standard or inverted levels from the host that specify character data, plot data, or a control code. Data Line 8 allows access to the extended ASCII character set. You can enable or disable this line via the Data Bit 8 parameter on the Dataproducts submenu (see page page 175).

Data Strobe. Carries a high true pulse from the host when data is ready. The data strobe remains high until the Data Request line goes false. The active edge of the strobe signal can be configured as leading, middle (default), or trailing.

Paper Instruction (PI). Carries a DVFU signal from the host with the same timing and polarity as the data lines.

Ready. Carries a high true signal from the printer when AC power and DC voltages are present, paper is loaded properly, and the printer is not in a check condition.

Online. Carries a high true signal from the printer when the Ready Line is true and the ON LINE key on the control panel has been pressed. When the printer is in online mode, it may accept data from the host.

Demand/Data Request. Carries a high true signal from the printer when the printer is ready to accept character data from the host. This signal changes to false shortly after the leading edge of the data strobe signal.

Cable Verify. Two pins on the interface connector are jumpered together to allow the user to verify proper installation of the interface connector.

Buffer Clear. A high true level from the host to indicate the printer should perform a reboot.

Parity Error. Always carries a low false signal from the printer indicating there is no parity error.

Dataproducts 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 to meet specific application requirements.

Refer to Chapter page 175 for Dataproducts parameter descriptions and information on selecting values for the following parameters:

Data Bit 8 (enable or disable)

PI Ignored (enable or disable)

Data Polarity (standard or inverted)

Data Request Polarity (standard or inverted)

Strobe Polarity (standard or inverted)

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 (see Table 10). 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 HostC1k signal, depending on the mode selected. See Table 10 for the different connector signals.

Signals

Table 10 lists each of the signals associated with the corresponding pins on the 1284 interface. Descriptions of the signals follow.

Table 10. 1284 Signals

Pin	Source of Data	Type of Mode		
		Compatible	Nibble	Byte
1	Host	nStrobe	HostClk	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

Table 10. 1284 Signals (continued)

Pin	Source of Data	Type of Mode		
		Compatible	Nibble	Byte
14	Host	nAutoFd	Host Busy	HostAck
15		Not Defined		
16		Logic Grid		
17		Chassis Grid		
18	Printer	Peripheral Logic High		
19		Signal Ground (nStrobe)		
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)		
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	aDataAvail
33		Not Defined		
34		Not Defined		
35		Not Defined		
36	Host	nSelectIn	1284 Active	1284 Active

NOTE: The length of the data cable from the host computer to the printer should not exceed 32 feet (10 meters).

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 / Interrup. 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 the line is high, the printer indicates all of its signals are in a valid state. When the line is 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.

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 at RP1 and RP2, shown in Figure 67.

If the values of these terminating resistors are not compatible with the particular interface driver requirements of your host computer, you may need to install resistors with different pull-up and pull-down values.

NOTE: Must be installed by an IBM service representative.
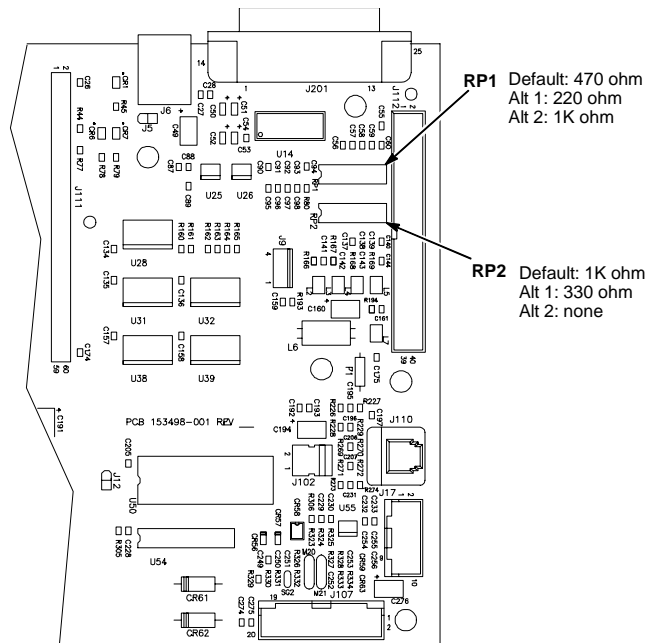
Figure 67. Resistor Locations

The shipping kit for this printer includes 220 ohm pull-up and 330 ohm pull-down alternate terminating resistors. If you install the 220 ohm pull-up resistor, you must also install the 330 ohm pull-down resistor. Table 11 lists the three terminating resistor configurations you can install:

Table 11. Terminating Resistor Configurations

Configuration	Pull-Up (RP1)	Pull-Down (RP2)
Factory Default	470 ohm	1K ohm
Alternate 1	220 ohm	330 ohm
Alternate 2	1K ohm	none

Removal And Installation

The procedure for removing and installing terminating resistors is provided in your *Maintenance Information Manual.*

Important

This is an involved maintenance procedure. To avoid damage to the equipment, only a trained technician should perform this procedure.

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 Cabinet

Clean the outside of the cabinet 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 Cabinet

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 68 (cabinet models) or Figure 69 (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 *Setup Guide*).

3. Unlatch both ribbon spools and carefully lift them off the hubs.

4. Raise the ribbon out of the ribbon path.

5. Using a soft–bristled non–metallic brush, remove paper, ribbon, and dust particles from the paper path, ribbon guides, and ribbon path.

6. Brush and vacuum accumulated paper, ribbon, and dust particles, especially in the tractor, hammer bank, and base pan areas.

7. **Cabinet models:** Brush and vacuum up dust or residue that has accumulated inside the lower cabinet.

8. **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.

9. **Cabinet and Pedestal models:** Install the ribbon (see page 63), load the paper (see page 66), and set the top–of–form (see page 77).
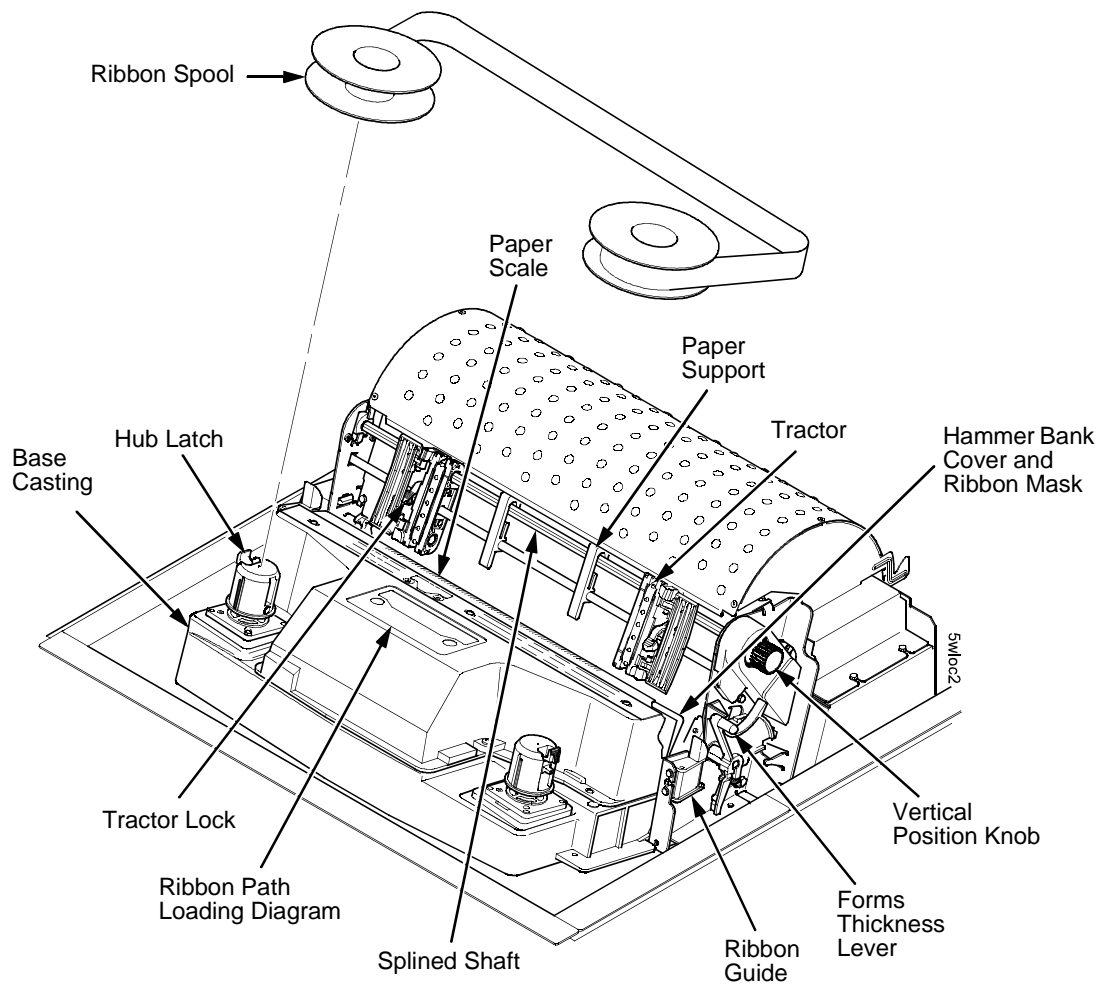
Figure 68. Interior Components of the Cabinet Models with Ribbon Spool Above

Ribbon Spool

Tractor Lock

Printer Cover

Tractor

Adjustable
Paper Guide

Shuttle
Cover
Assembly

Adjustable
Hinge

Tractor
Door

p6wclen

Operator
Panel

Forms
Thickness Lever

Splined Shaft

Ribbon Hub

Ribbon
Guide

Hub Latch
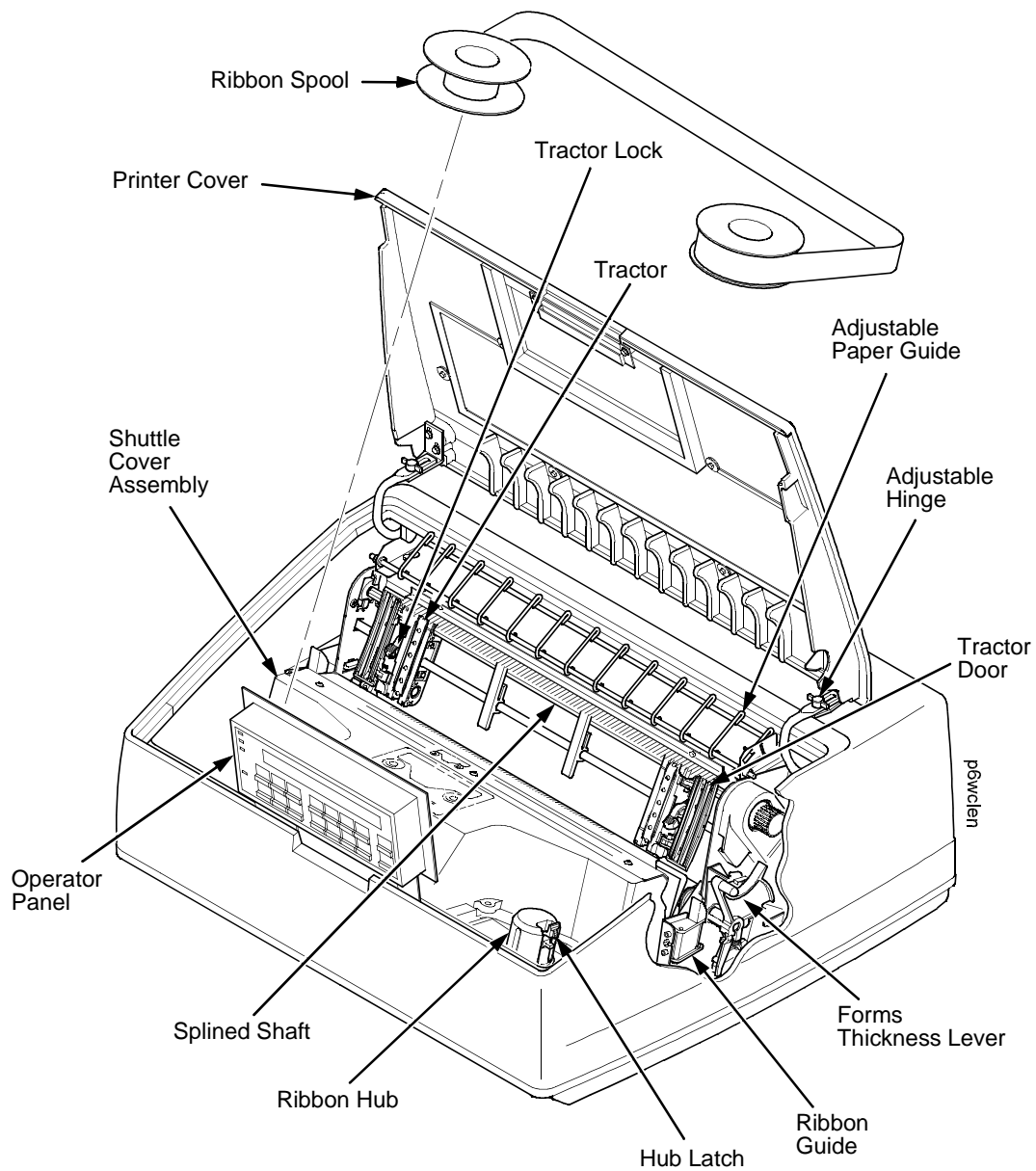
Figure 69. Interior Components of the Pedestal Models with Ribbon Spool Above

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's 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's 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**

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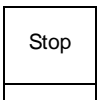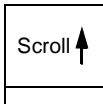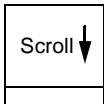
  A pattern of all uppercase E's repeated for ten lines and followed by a form feed to the next page top–of–form, used to identify paper motion or feeding problems, such as paper path obstruction or improper forms.
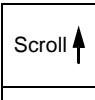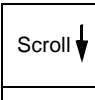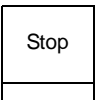
- **Underlines**

  An underline pattern useful for identifying hammer bank misalignment.

NOTE: The Operator Print Test menu is displayed in Chapter 4, "The Configuration Menus" on page 242.

Running The Printer Self–Tests

Step	Key	Result	Notes
1.	Make that the ribbon is installed and the printer is powered on and loaded with paper.		
2.	Press [Stop]	NOT READY	Places the printer in NOT READY mode.
3.	[Scroll ↑] + [Scroll ↓]	OPERATOR MENU UNLOCKED	Press both keys at the same time. Unlocking the Operator Menu allows you to test your printer.
4.	[Menu]	OPERATOR MENU PRINTER CONTROL	First of the series of configuration menus.
5.	[Scroll ↑] UNTIL	OPERATOR MENU OPERATOR PRINT TESTS	Advances to the OPERATOR PRINT TESTS menu.
6.	[Enter]	OPERATOR PRINT TESTS PRINTER DEMONSTRATION*	Advances to PRINTER DEMONSTRATION, the first option in OPERATOR PRINT TESTS menu.
7.	[Scroll ↑] UNTIL	OPERATOR PRINT TESTS [TEST NAME]	Cycles through the list of print tests until you reach the name of the test you wish to run.
8.	[Enter]	OPERATOR PRINT TESTS [TEST NAME]	The print test you have selected starts printing at either 80 or 136 columns, as specified.

Step	Key	Result	Notes
9.	Enter	OPERATOR PRINT TESTS [TEST NAME]	The print tests stops printing.
10.	Examine the print quality of the characters. They should be fully formed and of uniform density. If the test does not run or if text characters do not appear correctly formed, contact your IBM service representative.		
11.	Stop	NOT READY	Returns the printer to the NOT READY mode.
12.	Scroll ↑ + Scroll ↓	OPERATOR MENU LOCKED	Locks Program mode and the Operator Menu.
13.	Stop	READY	Returns the printer to the READY mode.

Hex Code Printout

A hex code printout (or hex dump) lists each ASCII/EBCDIC 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.
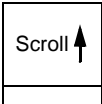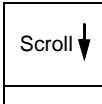
To convert an ASCII/EBCDIC character to its corresponding hex code (or vice–versa), refer to the ASCII code chart in the *6400 ASCII Programmer's Reference Manual*, or the EBCDIC code chart in the *6400 Coax/Twinax Programmer's Reference Manual.*

Each printable character prints both as its assigned symbol and as its hex equivalent. Each nonprintable character prints both as a period (.) and as its hex equivalent.

When using a parallel interface, the letter "p" before a hex code indicates an active Paper Instruction (PI) line and a blank space before a hex code indicates an inactive PI line.

To obtain a hex code printout, perform the following steps.

NOTE: The asterisks (*) indicate steps specific to using the coax/twinax interface menus which are only displayed when the IBM Coax/Twinax feature is installed.

Step	Key	Result	Notes
1. Press	Stop	NOT READY	Places the printer in NOT READY mode.
2.	Scroll↑ + Scroll↓	OPERATOR MENU UNLOCKED	Press both keys at the same time. Unlocking the Operator Menu allows you to test your printer.
3.	Menu	OPERATOR MENU PRINTER CONTROL	First of the series of configuration menus.
*	Scroll↑	OPERATOR MENU COAX INTERFACE **Or** OPERATOR MENU TWINAX INTERFACE	Moves forward to the COAX INTERFACE or TWINAX INTERFACE option.
4.	Enter	PRINTER CONTROL INTERFACE SELECTION	Moves forward to the INTERFACE SELECTION option.
*		COAX INTERFACE PRINT LANGUAGE **Or** TWINAX INTERFACE PRINT LANGUAGE	
5.	Scroll↑ UNTIL	PRINTER CONTROL HEX PRINT MODE	Moves forward to the HEX PRINT MODE option.

Step	Key	Result	Notes
*		COAX INTERFACE HEX PRINT MODE **Or** HEX PRINT MODE	Moves forward to the HEX PRINT MODE option.
6.	Enter	HEX PRINT MODE DISABLE*	Moves forward to DISABLE, the active option.
7.	Scroll ↑	HEX PRINT MODE ENABLE	Moves forward to ENABLE, the alternate option.
8.	Enter	HEX PRINT MODE ENABLE*	Asterisk (*) indicates this choice is now active.
9.	Stop	NOT READY	Returns the printer to the NOT READY mode.
10.	Scroll ↑ + Scroll ↓	OPERATOR MENU LOCKED	Press both keys at the same time to relock the Operator Menu.
11.	Start	READY	Returns the printer to the READY mode.
		HEX DUMP ACTIVE	The message HEX DUMP ACTIVE flashes briefly.

12. A hex code printout results when data is sent to the printer with HEX PRINT MODE enabled. After obtaining the printout, return to normal print mode by disabling HEX PRINT MODE.

NOTE: Printing in Hex Mode may alter prior print attributes set by the host computer. A soft reset or power-off may be required after disabling HEX PRINT MODE.

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

Figure 70. Sample ASCII Hex Code Printout

```
PRINTER CONTROL INFORMATION AREA
ADDR    0   1   2   3   4   5   6   7   -   8   9   A   B   C   D   E   F
   0 =  20  04  00  00  00  00  00  00  -  00  00  13  70  1D  10  1C  00
  10 =  04  06  00  50  01  00  03  64  -  00  00  00  00  00  00  00  00
  20 =  00  00  00  00  00  00  00  00  -  00  00  00  00  00  00  00  00
  30 =  00  00  00  00  00  00  00  00  -  00  00  00  00  00  00  00  00
  40 =  00  00  00  00  00  00  00  00  -  00  00  00  00  00  00  00  00

PRINTER BUFFER AREA
ADDR    0   1   2   3   4   5   6   7   -   8   9   A   B   C   D   E   F
  50 =  00  01  02  03  04  05  06  07  -  08  09  0A  0B  0C  0D  0E  0F
  60 =  10  11  12  13  14  15  16  17  -  18  19  1A  1B  1C  1D  1E  1F
  70 =  20  21  22  23  24  25  26  27  -  28  29  2A  2B  2C  2D  2E  2F
  80 =  30  31  32  33  34  35  36  37  -  38  39  3A  3B  3C  3D  3E  3F
  90 =  40  41  42  43  44  45  46  47  -  48  49  4A  4B  4C  4D  4E  4F      äåàáãàçñ¢.<(+|
  A0 =  50  51  52  53  54  55  56  57  -  58  59  5A  5B  5C  5D  5E  5F      &éêëèíîïìß!$*);¬
  B0 =  60  61  62  63  64  65  66  67  -  68  69  6A  6B  6C  6D  6E  6F      -/ÂÄÀÁÃÅÇÑ¦,%_>?
  C0 =  70  71  72  73  74  75  76  77  -  78  79  7A  7B  7C  7D  7E  7F      øÉÊËÈíîïì`:#@'="

ADDR    0   1   2   3   4   5   6   7   -   8   9   A   B   C   D   E   F
  D0 =  80  81  82  83  84  85  86  87  -  88  89  8A  8B  8C  8D  8E  8F      Øabcdefghi«»ðýþ±
  E0 =  90  91  92  93  94  95  96  97  -  98  99  9A  9B  9C  9D  9E  9F      °jklmnopqrªºæ¸Æ¤
  F0 =  A0  A1  A2  A3  A4  A5  A6  A7  -  A8  A9  AA  AB  AC  AD  AE  AF      µ~stuvwxyz¡¿ÐÝÞ®
 100 =  B0  B1  B2  B3  B4  B5  B6  B7  -  B8  B9  BA  BB  BC  BD  BE  BF      ^£¥•©§¶¼½¾[]¯¨´×
 110 =  C0  C1  C2  C3  C4  C5  C6  C7  -  C8  C9  CA  CB  CC  CD  CE  CF      {ABCDEFGHI—ôöòóõ
 120 =  D0  D1  D2  D3  D4  D5  D6  D7  -  D8  D9  DA  DB  DC  DD  DE  DF      }JKLMNOPQR¹ûüùú¥
 130 =  E0  E1  E2  E3  E4  E5  E6  E7  -  E8  E9  EA  EB  EC  ED  EE  EF      \÷STUVWXYZ²ôöòóõ
 140 =  F0  F1  F2  F3  F4  F5  F6  F7  -  F8  F9  FA  FB  FC  FD  FE  FF      0123456789³ûüùú
```

Figure 71. Sample Coax Hex Code Printout

274

```
0              |              1              |              2              |              3              |              4
0000000000000000111111111111111122222222222222223333333333333334
0123456789ABCDEF0123456789ABCDEF0123456789ABCDEF0123456789ABCDEFO


0              |              1              |              2              |              3              |
4444444444444444555555555555555566666666666666667777777777777778
123456789ABCDEF0123456789ABCDEF0123456789ABCDEF0123456789ABCDEFO
 ßäàáãäçñ¢.<(+|&éëèéíîïìß!$*);¬−/ÃÀÁÄÅÂÇÑ¦,%_>?øÉËÈÉíîïì`:#@'="Ø

0              |              1              |              2              |              3              |
8888888888888888999999999999999AAAAAAAAAAAAAAAABBBBBBBBBBBBBBBC
123456789ABCDEF0123456789ABCDEF0123456789ABCDEF0123456789ABCDEFO
abcdefghi«»ðýþ±° jklmnopqrªºæ¸ÆØµ~stuvwxyz¡¿ÐÝÞ®^£¥·©§¶¼½¾[]‾¨'×{

0              |              1              |              2              |              3              |
CCCCCCCCCCCCCCCDDDDDDDDDDDDDDDDEEEEEEEEEEEEEEEEFFFFFFFFFFFFFFFF
123456789ABCDEF0123456789ABCDEF0123456789ABCDEF0123456789ABCDEF
ABCDEFGHI−âäàáãå}JKLMNOPQR¹ûüùúÿ\÷STUVWXYZ²ôöòóõ0123456789³ÛÜÙÚ
```

Figure 72. Sample Twinax 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 12: explains each fault message and describes how to correct the fault condition. Displayed faults fall into one of two categories:

• Operator correctable.

• IBM 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:

1. Press any key except **Form Feed** or **Stop** to silence the alarm if necessary.

2. Write down the number of the error message(s) being displayed.

3. Read the fault explanation, then proceed to fix the problem, if possible.

4. Press **Stop** to clear the fault message. Press **Start** to return to Ready mode, and resume printing.

5. If the fault message reappears, power off the printer, wait 15 seconds, then power on the printer.

6. Run your print job again. If the fault message reappears, turn off power to the printer, then call your IBM service representative. Otherwise, no further attention is required.

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

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
XXX 48 VOLTS CIRCUIT FAILED SEE SETUP GUIDE	No	The power supply is not generating a proper 48 volts or the CMX board is not properly detecting a 48 volt output.	Contact your IBM service representative.
001 END OF FORMS LOAD FORMS	Yes	Printer is out of paper.	Load paper according to instructions on page 66.
002 FORMS JAMMED CLEAR JAM AND RELOAD FORMS	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 SYSTEM REQUEST ATTENTION	Yes	Host attention message.	The host computer or printer controller requires attention.
007 FM HEADER ERROR	No	Format header error. Applications software has violated format header parameters.	Contact your system administrator.
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.

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
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.
011 SCS COMMAND ERROR	No	Printer received undefined control character.	Contact your system administrator.
012 STRUCTURED FIELD ERROR	No	Applications software has violated structured data field parameters.	Contact your system administrator.
013 ACTIVATE LOST	No	Printer detects twinax protocol communication errors.	The printer reports the error.
014 INVALID ACTIVATE	No	Printer detects twinax protocol communication errors.	The printer reports the error.
015 COMMUNICATION CHECK CHECK CABLE	Yes	Line not active. (Twinax interface)	Check cable connection.
016 INVALID COMMAND	No	Printer detects twinax protocol communication errors.	The printer reports the error; host action is required.
017 STACKER JAM CHECK STACKER	Yes	Paper is jammed in the power stacker area.	Remove paper.
018 STACKER FULL CHECK STACKER	Yes	Power stacker is full of paper.	Remove paper.
019 STACKER FAULT CHECK STACKER	Yes	Stacker is not functioning correctly	Check for obstructions in the stacker area. If fault persists, contact your IBM service representative.
021 RECEIVE BUFFER OVERRUN VERIFY CONFIGURATION	Yes	Receive overrun. (Serial interface)	Check printer serial port configuration setup. Ensure that baud rate matches both host and printer settings.

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
022 UNIT ADDRESS NOT RECEIVED CHECK PRINTER ADDRESS	Yes	Unit address not recognized by printer. (Poll timeout, twinax interface)	Ensure that printer address matches host setting.
024 SERIAL LINE PARITY ERROR VERIFY CONFIGURATION	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.
027 COMMUNICATIONS CHECK CALL SYSTEM OPERATOR	Yes	Enable poll timeout. The printer was not enabled for one minute. (Coax interface)	Check cable connection and host system.
028 COMMUNICATIONS CHECK CALL SYSTEM OPERATOR	Yes	Poll timeout error. The printer was not polled for one minute. (Coax interface)	Check cable connection and host system.
029 8344 DIAGNOSTIC TEST FAILED	No	Link–level code test detects hardware failure.	Contact your IBM service representative.
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. Refer to the *Setup Guide* for procedures.
032 FORMS JAMMED TIMEOUT CLEAR JAM 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. Refer to the *Setup Guide* for procedures..

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
034 RIBBON STALL TIMEOUT CHECK RIBBON	Yes	A timeout message is sent to the host if no ribbon movement has occurred 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 your IBM service representative.
037 STACKER JAM TIMEOUT CHECK STACKER	Yes	A timeout message is sent to the host if paper is not loaded 10 minutes after **Stop** was pressed to clear the stacker jam fault.	Clear stacker jam and reload paper. See *Operator's Guide* for procedure.
038 STACKER FULL TIMEOUT CHECK STACKER	Yes	A timeout message is sent to the host if paper is not loaded 10 minutes after **Stop** was pressed to clear the stacker full fault.	Remove paper from the stacker.
039 STACKER FAULT TIMEOUT CHECK STACKER	Yes	A timeout message is sent to the host if paper is not loaded 10 minutes after **Stop** was pressed to clear the stacker fault.	Check for obstructions in the stacker area. If fault persists, contact your IBM service representative.
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.
042 CUSTOM SET DOES NOT EXIST SAVE FIRST	Yes	This custom configuration set does not exist.	Save the custom set. Refer to "" on page 94.
043 CUSTOM SET ALREADY EXISTS DELETE FIRST	Yes	Custom set is write–protected.	Delete existing set, then save new set.
044 EC FIRMWARE/ HARDWARE ERROR	No	Fatal firmware error on the controller board.	Contact your IBM service representative.

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
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 your IBM service representative.
056 HAMMER COIL OPEN	No	Electrical malfunction of one or more hammer coils.	(You can continue to print with degraded print quality.) Contact your IBM service representative.
057 CLOSE PLATEN	Yes	Forms thickness lever is raised to the open position.	Lower the forms thickness lever.
058 SHUTTLE JAM SEE SETUP 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 your IBM service representative.
059 CANCEL PRINT ACTIVE	N/A	Non–error status message.	No action necessary.
060 PRINTER HOT	No	Controller board sensors report high temperatures on the board.	Contact your IBM service representative.
062 EXHAUST FAN FAULT	Yes	Sensors cannot detect current in fan circuit.	Power off the printer. Check for obstruction of vents and fan airway; remove any obstructions. Check for items beneath the printer blocking cabinet vents. Power back on the printer. If this message reoccurs, contact your IBM service representative. **NOTE:** This message should not appear on a Pedestal model. If this message does appear, contact your IBM Service Representative.

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
065 HAMMER BANK FAN FAULT	Yes	Sensors cannot detect current in fan circuit.	Power off the printer. Check for obstruction of vents and fan airway; remove any obstructions. Check for items beneath the printer blocking cabinet vents. Power back on the printer. If this message reoccurs, contact your IBM service representative.
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 your IBM service representative.
082 POWER SUPPLY 8.5V FAILED	No	Internal power failure.	Contact your IBM service representative.
083 INTAKE FAN FAULT	Yes	Sensors cannot detect current in fan circuit.	Power off the printer. Check for obstruction of vents and fan airway; remove any obstructions. Check for items beneath the printer blocking cabinet vents. Power back on the printer. If this message reoccurs, contact your IBM service representative.
084 POWER SUPPLY 48V FAILED	No	Internal power failure.	Contact your IBM service representative.
085 CONTROLLER VOLTAGE	No	Controller voltage failure.	Contact your IBM service representative.
086 CONTROLLER 15V	No	Controller voltage failure.	Contact your IBM service representative.
087 PLATEN OPEN TIMEOUT CLOSE PLATEN	Yes	Forms thickness lever has been open for at least one minute.	Close forms thickness lever.
088 CONTROLLER 23.5V	No	Controller voltage failure.	Contact your IBM service representative.

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
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 your IBM service representative.
090 SHUTTLE COVER OPEN CLOSE SHUTTLE COVER	No	Shuttle cover is missing, damaged, or not correctly installed.	Contact your IBM service representative.
092 RIBBON DRIVER CIRCUIT	No	Controller board does not detect ribbon drive motor.	Contact your IBM service representative.
101 UPPER DRIVER SHORT	No	Hammer driver circuits on the controller board shorted to ground.	Contact your IBM service representative.
102 LOWER DRIVER SHORT	No	Circuit(s) on the hammer bank or in the hammer bank power cable shorted to ground.	Contact your IBM service representative.
104 ERROR:DP FIFO BUSY	No	There is a timing problem in the Engine Controller (EC) firmware.	Cycle power. If problem does not clear, contact your IBM service representative.
107 H/B CONTROL MODE	No	A status message indicating that one or more hammer coils are hotter than normal and the printer will run in half–speed mode until they cool down. This can occur during especially dense print jobs.	None required. The printer automatically corrects the condition by running at half–speed mode until the hammers cool down, at which point it resumes full speed printing.
110 STACK OVERFLOW SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
111 STACK UNDERFLOW SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
112 UNDEFINED OPCODE SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
113 PROTECTED INSTRUCTION SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
114 ILLEGAL OPERAND ACCESS SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
115 ILLEGAL INSTRUCTION ACCESS SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
116 ILLEGAL EXTERNAL BUS ACCESS SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
117 A TO D OVERRUN SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
118 UNDEFINED INTERRUPT SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
119 TCB CORRUPTED SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
120 ACCESS NULL POINTER SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
121 PAPER NOT AT SPEED SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
122 PAPER NOT SCHEDULED SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.

283

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
123 PAPER BUSY TOO LONG SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
124 PAPER FIFO OVERFLOW SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
125 PAPER FIFO UNDERFLOW SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
126 PAPER FEED BAD TABLE SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
127 PAPER FEED ILLEGAL STATE SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
128 PAPER FEED INVALID COMMAND SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
129 PAPER FEED INVALID PARAMETER SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
130 PAPER FEED PARTLY ENERGIZED SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
131 PAPER FEED INTERRUPT SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
132 RIBBON INVALID COMMAND SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
133 RIBBON INVALID STATE SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
XXX PAPER FEED DRIVER CIRCUIT FAILED SEE SETUP GUIDE	No	The paper feed driver circuit on the CMX board is drawing too much current.	Contact your IBM service representative.
134 PLATEN INVALID COMMAND SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
135 PLATEN INVALID STATE SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
136 PLATEN INVALID PARAMETER SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
XXX SHUTTLE DRIVER CIRCUIT FAILED SEE SETUP GUIDE	No	The shuttle driver circuit on the CMX board is drawing too much current.	Contact your IBM service representative.
137 SHUTTLE INVALID COMMAND SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
138 SHUTTLE INVALID PARAMETER SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
139 SHUTTLE OVERSPEED SEE SETUP GUIDE	No	Fatal firmware error on the controller board.	Contact your IBM service representative.
990 MACHINE CHECK	N/A	Host status message.	No action necessary.

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
NON–VOLATILE MEMORY FAILED	No	Non–volatile memory fault.	Contact your IBM service representative. **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 your IBM service representative.
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.
PA1 SELECTED	N/A	Attach status message.	No action necessary.
PA2 SELECTED	N/A	Attach status message.	No action necessary.
P05 DIAGNOSTIC TEST PASSED	N/A	Non–error status message.	No action necessary.

Table 12: Fault Messages

Fault Message	Operator Correctable?	Explanation	Solution
P17 SECURITY VIOLATION	No	Security code of PAL on controller board does not match code of firmware on the controller board.	Contact your IBM service representative.
PLEASE WAIT... RESET IN PROGRESS	N/A	Printer reset in progress.	No action necessary.
PRINTER UNDER REMOTE CONTROL	Yes	Indicates that remote management software has control of the printer.	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.

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.

6400i Models Except 6400-i20 and -i24

IBM Premium 20   P/N 54P2309
Used for general Text Printing as well as OCR, graphics, and bar code printing. Average yield: 20 million DP characters, 4667 AIAG-B3 labels with visible light source scanning equipment, or 2500 AIAG-B3 labels with infrared light source scanning equipment.

IBM Premium 30   P/N 57P2308
Used for general Text Printing as well as OCR, graphics, and bar code printing. Average yield: 30 million DP characters, 4667 AIAG-B3 labels with visible light source scanning equipment, or 2500 AIAG-B3 labels with infrared light source scanning equipment.

6400-i20 and i24 Models

IBM Premium 2000 Ribbon (box of 12)   P/N 54P1095

Used for general text printing as well as Optical Character Recognition (OCR), graphics, and bar code printing. Average yield 60 million DP characters, 4700 AIAG-B3 labels with visable light source scanning equipment. This ribbon is not recommended for use with infrared (IR) scanning equipment.

Ordering Ribbons

6400-ixx Models

IBM Printing Supplies are distributed through Priority Fulfillment Services (PSFweb) and a worldwide network of dealers. Please contact one of the following numbers to place an order for IBM 6400-i ribbons or to locate an IBM Printing Supplies Dealer in your area:

United States and Canada

Please call 1-888-IBM-PRINT

EMEA

IBM Supplies Fulfillment Operations (ISFO) at 31-43-350 2756 (within the Netherlands call: 043-350 2756.) Toll free numbers to ISFO have been established in the following countries:

Belgium	0800 71950	Germany	0800 18 18 005
Denmark	800 15534	Norway	800 11389
Finland	08001 13110	Spain	900 983131
France	0800 905 5871	Sweden	0207 94270
Italy	800 820094	UK	08009 68679

AP and LA

Please call 1-972-881-0733 ext. 3234

Warranty Information

The approximate average yields are not a warranty or guarantee of minimum life and are provided to assist in initial supplies planning. Actual usage should be used to establish the supply's life in the end user's application. Many factors such as print coverage per page, machine settings, paper type and size, and environmental conditions can affect supply life.

Supply warranties are only for defects in materials and workmanship at the time of shipment and installation. They are not for print count life or normal wear and tear, nor for any print count minimum. Contact your place of purchase for warranty return instructions.

Paper Specifications

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*, 3 to 16 inches with stacker, 2 to 24 inches (5.08 to 60.96 cm) long**, 5 to 12 inches with stacker.	
	• Single-part: 15 pound (57 g/m^2) to 100 pound (377 g/m^2) 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.	
	• Recycled paper not recommended with stacker.	
Sheet Thickness	0.025 inches (0.064 cm) maximum	
Drive	Adjustable tractors (6-pin engagement)	
Slew Rate	Fast	Slow
6400-i50	12 ips	10.4 ips
6400-i5P	12 ips	10.4 ips
6400-i10	20 ips	10.4 ips
6400-i10 w/Stacker	20 ips	10.4 ips
6400-i1P	16 ips	10.4 ips
6400-i15	25 ips	10.4 ips
6400-i15 w/Stacker	25 ips	10.4 ips
6400-i20	36 ips	18 ips
6400-i20 w/Stacker	36 ips	18 ips
6400-i2s	36 ips	18 ips
6400-i2s w/Stacker	36 ips	18 ips
6400-i24	36 ips	18 ips
6400-i24 w/Stacker	36 ips	18 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: 41 inches (103.3 cm)

Width: 27 inches (68.6 cm)

Depth: 29 inches (73.7 cm)

Weight: 225 lbs. (102.1 kg) unpackaged
237 lbs. (112. kg) unpackaged with power stacker
285 lbs. (129.3 kg) packaged
297 lbs. (139 kg) packaged with power stacker

Pedestal Models

Height: 35.5 inches (90.2 cm)

Width: 24.6 inches (62.5 cm)

Depth: 30 inches (76.2 cm)

Weight: 120 pounds. (54.4 kg) unpackaged
160 pounds. (72.6 kg) packaged

Environmental Characteristics

Temperature

Operating: 50° to 104° F (10° to 40°C) up to 5000 feet (1524 meters), 50° to 90° F (10° to 32°C) up to 8000 feet (2438 meters)

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

Relative Humidity

Operating: 15% to 80% (noncondensing)

Storage: 15% to 90% (noncondensing)

Acoustic Noise Level

	Cabinet Models			Pedestal Models	
Acoustic Noise Levels per ISO 9296	-i05 -i10	-i15	-i20 -i2s -i24	-i5P	-i1P
Printing	50 dB	52 dB	55 dB	62 dB	66 dB
	6.7 Bel	7.0 Bel	7.1 Bel	7.8 Bel	8.2 Bel
Standby	46 dB	46 dB	42 dB	46 dB	46 dB
	6.3 Bel	6.3 Bel	5.8 Bel	6.3 Bel	6.3 Bel
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			
		500 LPM	**1000 LPM**	**1500 LPM**	**2000 LPM 2400 LPM**
88-140 V RMS	47-63 Hz	6A @ 100 V	6A @ 100 V	8A @ 100 V	9A @ 100V
178-270 V RMS	47-63 Hz	3A @ 200 V	3A @ 200 V	5A @ 200 V	9A @ 100V

Power Consumption

6400-i50
6400-i5P

120 VAC 60 Hz	Operating DP Mode		Standby	
	All H's	**ECMA132***	**Not Energy Star**	**Energy Star**
Watts	210	167	80	21
BTU/Hour	717	570	273	71
VA	300	291	120	36

220 VAC 60 Hz	Operating DP Mode		Standby	
	All H's	**ECMA132***	**Not Energy Star**	**Energy Star**
Watts	210	176	80	22
BTU/Hour	717	601	273	75
VA	340	194	130	41

*ECMA132 Standard Spread Sheet Pattern (ISO 10561)

6400-i10
6400-i1P

120 VAC 60 Hz	Operating DP Mode		Standby	
	All H's	**ECMA132*I**	**Not Energy Star**	**Energy Star**
Watts	300	197	80	25
BTU/Hour	1025	673	273	85
VA	530	342	140	48

220 VAC 60 Hz	Operating DP Mode		Standby	
	All H's	**ECMA132***	**Not Energy Star**	**Energy Star**
Watts	290	198	80	25
BTU/Hour	990	676	273	85
VA	600	227	150	55

6400-i15

120 VAC 60 Hz	Operating DP Mode		Standby	
	All H's	**ECMA132***	**Not Energy Star**	**Energy Star**
Watts	440	231	90	27
BTU/Hour	1502	788	307	92
VA	740	388	160	50

*ECMA132 Standard Spread Sheet Pattern (ISO 10561)

220 VAC 60 Hz	Operating DP Mode		Standby	
	All H's	ECMA132*	Not Energy Star	Energy Star
Watts	420	243	90	27
BTU/Hour	1434	829	307	92
VA	830	277	170	58

6400-i20
6400-i2s
6400-i24

120 VAC 60 Hz	Operating DP Mode		Standby	
	All H's	ECMA132*	Not Energy Star	Energy Star
Watts	637	251	119	28
BTU/Hour	2175	857	406	95.6
VA	690	291	120	30.7

220 VAC 60 Hz	Operating DP Mode		Standby	
	All H's	ECMA132*	Not Energy Star	Energy Star
Watts	604	268	111	28
BTU/Hour	2062	915	379	95.6
VA	686	280	122	30.7

*ECMA132 Standard Spread Sheet Pattern (ISO 10561)

Interfaces

Type	Standard	IEEE 1284 Parallel, Centronics Parallel, RS-232/RS-422 Serial, Dataproducts Parallel.
	Optional	Coax, Twinax, Dataproducts Long Line, Ethernet 10/100Base-T
Logic Levels	TTL/EIA-232-E, EIA-422-B	
Data Format:	ASCII	
Compatibility	EIA-232-E, EIA-422-B, PC Parallel, Dataproducts, IEEE 1284, Twinax, Coax, Ethernet	
Transfer Rates	Up to 200K bytes/sec on parallel interfaces Up to 19.2 K baud on RS-232 serial interface Up to 115.2K baud on RS-422 serial interface	
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 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

• Dataproducts Adapter Feature

AS/400: The 6400 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

297

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)

Coax/Twinax Interface Feature: Contact your IBM service representative for attachment requirements.

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 13 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 13. 6400I Nominal Print Rates (1 of 2)

PRINT QUALITY DOT DENSITY (DPI) Note 1	CHARACTERS PER INCH	DOT MATRIX Note 2	PERFORMANCE									
			Uppercase Only LPM					Descenders & Underline LPM				
			500	1000	1500	2000s	2400	500	1000	1500	2000s	2400
CORRESPONDENCE 90 (180) x96	10 12 15	7(13) x 9+3 6(11) x 9+3 (9) x 9+3	200	400	600	842	960	500	306	459	648	738
DATA PROCESSING 60(120) x72	10 12 13.3 15 17.1	5(9) x 7+2 4(7) x 7+2 4(7) x 7+2 3(5) x 7+2 3(5) x 7+2	375	750	1125	1500	1800	300	600	900	1200	1400
HIGH SPEED 60(120) x 48	10 12 13.3	5(9) x 5+1 4(7) x 5+1 4(7) x 5+1	500	1000	1500	2000	2400	428	865	1284	1714	2000
Note 1	A (B) x C, where:		A is maximum horizontal dot density B is horizontal dot placement density C is vertical dot density									
Note 2	D (E) x F + G, where:		D is maximum number of dots that may be placed on E horizontal positions F is number of vertical dots for uppercase symbols G is number of dots available for descenders									

Table 14. 6400I Nominal Print Rates (2 of 2)

PRINT QUALITY DOT DENSITY (DPI) Note 1	CHARACTERS PER INCH	DOT MATRIX Note 2	PERFORMANCE Plot Mode IPM				
			500	1000	1500	2000	2400
CORRESPONDENCE 90 (180) x 96	10 12 15	7(13) x 9+3 6(11) x 9+3 (9) x 9+3	21	42	61	87	94
DATA PROCESSING 60(120) x 72	10 12 13.3 15 17.1	5(9) x 7+2 4(8) x 7+2 4(8) x 7+2 3(5) x 7+2 3(5) x 7+2	42	83	127	167	185
HIGH SPEED 60(120) x 48	10 12 13.3	5(9) x 5+1 4(7) x 5+1 4(7) x 5+1	62	124	186	250	266
Note 1	A (B) x C, where:		A is maximum horizontal dot density B is horizontal dot placement density C is vertical dot density				
Note 2	D (E) x F + G, where:		D is maximum number of dots that may be placed on E horizontal positions F is number of vertical dots for uppercase symbols G is number of dots available for descenders				

B *A Quick Look at Line Matrix Printing*

Character Formation

The IBM 6400 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 73.

Dot Column

Matrix visible only to the printer

Dot Row

Ink dots formed by hammer tips

Character Row

Character Column
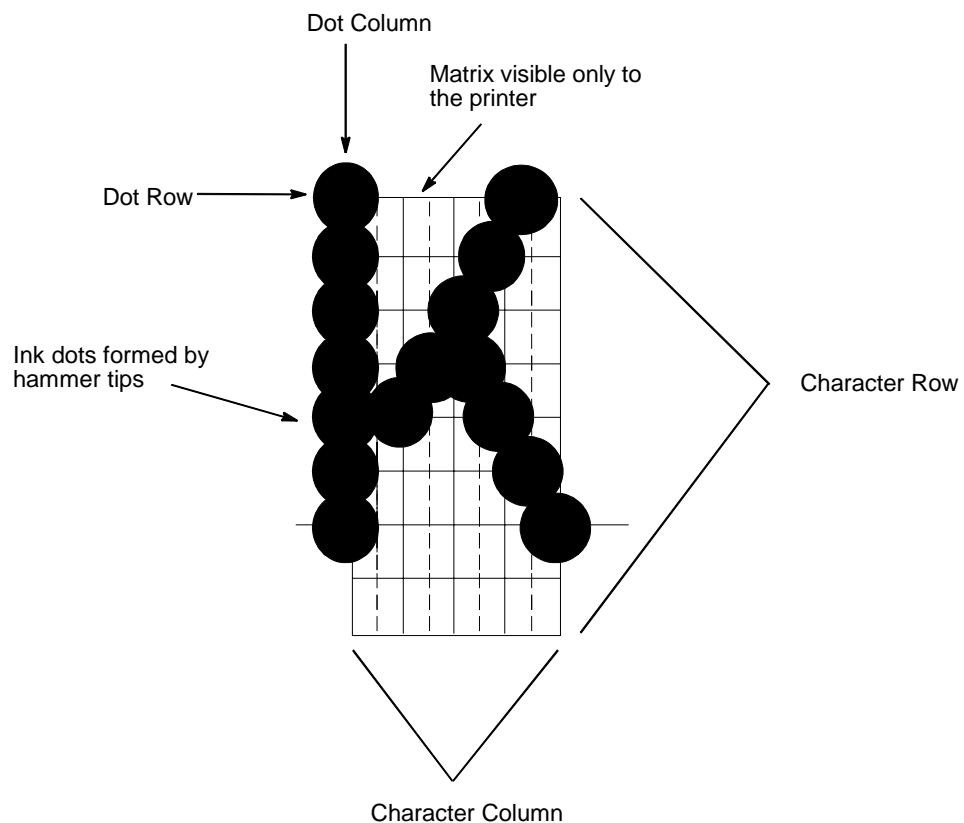
Figure 73. Typical Character Formation

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 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 74, 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.

*   Used for lowercase descender only
* *   Used for underline and lowercase descender
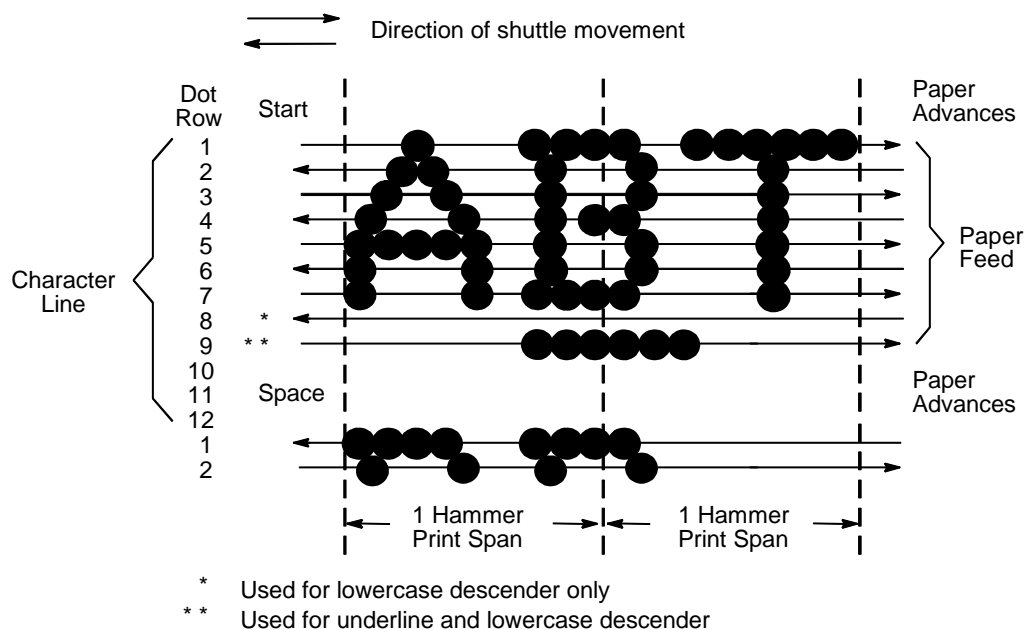
Figure 74. Line Matrix Printing

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.

C   *Host Attachment*

Host Attachment

The following paragraphs provide information that will help you plan your attachment of this printer to your system. Refer to for special system requirements.

This printer attaches to the following host devices and workstations:

- iSeries Host Systems (formerly AS/400) – Parallel Port and Twinax Interface
- zSeries Host Systems (formerly VM, MVS, VSE) – Coax Interface
- 3174 Controller – Asynchronous Emulation Adapter
- IBM Personal Computer Systems – ASCII Serial or Parallel port
- pSeries (formerly RS/6000) – ASCII Serial or Parallel port
- Non-IBM systems that support ASCII attachments through the following interfaces: EIA-232-E Serial, EIA-422-B Serial, PC Parallel, Dataproducts Parallel, and IEEE 1284 Parallel
- Ethernet and Token Ring LANs via the Network Print Server features
- Ethernet LANs via the 6400 Ethernet feature

NOTE: When a coax/twinax feature is installed, it attaches to host devices and workstations that support coax/twinax.

Table 15: Operating System Support

Operating Systems Supported	Special Notes/Requirements
pSeries (AIX)	• Supported by Version 3.1.5 or later.
iSeries	• Supported by OSV5R1 or later.
Windows	• Supported by Microsoft Windows 95/98, NT 4.0, 2000, and XP.
zSeries (z/OS, z/VM, VSE/ESA)	• Existing non-graphics printing applications for the IBM 4234 (Model 001) and IBM 3287 are supported and can be used with this printer. • Supported by 3174 with AEA release A5.4 or later, Release B4.0 or later, and Release C1.1 or later.
Other Operating Systems	• Supported by other operating systems through attaching this printer to the following interfaces: EIA-232-E Serial, EIA-422-B Serial, PC Parallel, Dataproducts Parallel, and IEEE 1284 Parallel. • When attaching this printer to a Digital Equipment Corporation** VAX** machine, the preferred attachment is through EIA-232-E serial interface.

NOTE: For more specific information, refer to either the *6400 ASCII Programmer's Reference Manual* or the *6400 Coax/Twinax Programmer's Reference Manual.*

Compatibility and Limitations

The following are some compatibility and limitation considerations you should be familiar with before attaching this printer with your system.

Compatibility

• The Proprinter III XL emulation is very similar to the datastream used by the IBM 4202-003 Proprinter but contains more features. This protocol enables this line matrix printer to closely emulate a moving-head serial matrix printer but does not support downloaded fonts. In addition, NLQ compresses to 17.1 CPI, not 20 CPI.

• The Epson-LQ emulation does not support downloaded characters or print justification. In addition, near letter quality (NLQ) compresses to 17.1 CPI not 20 CPI.

- For P-Series emulation, differences in supported fonts and control codes may exist between the IBM 6400 and Printronix printers. Downloaded character overlays and downloaded character sets are not supported. Detailed information on supported fonts and control codes can be found in the *6400 ASCII Programmer's Reference Manual*.

- For P-Series XQ Variant, the IBM 6400 only prints condensed print at 15 CPI like the Printronix P600, but unlike the P300, which printed condensed print at either 13.3 or 16.7 CPI.

- Emulation differences may exist between the IBM 6400 with Epson FX 1050 emulation and the Printronix MVP 150B, which used the Epson MX emulation.

- Application differences may exist between the IBM 6400 and the Printronix MVP-150C printers due to additional print quality modes which the 6400 does not support.

- Printronix printers with an "L" in the model design indicate the printer has the capability to print smaller dots. The IBM 6400 will print text-only applications that were printed by L-Series printers. Applications requiring the printing of anything other than text will not be supported.

- DAVFU, DVFU, NVFU and CVFU Vertical Format Units, along with the optional uses of the Serial Data Bit 8, are not supported.

- Printronix P6XX0 models using older C1 controllers, which are primarily installed in Europe, are not supported.

- The following printers, which are similar to Printronix printers, are not supported by the IBM 6400 printer: KPG Panda, TRILAx (Trilog Inc.) and Gentry REVerse Paper Feed.

- The IBM 6400 does not support compatibility with the Printronix P1013 or the P4160.

- IBM printers with the following interfaces are not supported: S/370 Channel Attachment, QMS** 2780 or 3780 Bisync-to-ASCII attachment, RS-232 as Current Loop, and Dataproducts Long Lines.

Limitations

- Forms length maximum of 24 inches. In the cabinet models, forms longer than 12 inches can be accommodated by opening the front and rear doors.

- Maximum forms width of 17 inches (including tear strips) or 16 inches (without tear strips).

- Use 15 to 100 pound (6.8 to 45.36 kg) stock with a maximum thickness of 0.025 inches (0.0635 cm).

- Maximum print line of 13.6 inches.

- Friction feed paper handling is not supported.

- Use of high speed (Draft mode) fonts using greater than 15 CPI for critical applications should be tested, prior to production use, using your application to determine if the output is satisfactory.

- Processing of forms with black or dark colored backing, or forms with see-through plastic or cellophane covered openings or windows may give false End-of-Forms (EOF) signals. Request For Price Quote (RPQ) S02392 (factory-installed) or S02394 (field-installed) may be ordered to provide a modified EOF switch to handle these types of forms. Contact your IBM Sales Representative or IBM Authorized Remarketer.

- Downloaded characters are not supported in Proprinter, Epson, P-Series, P-Series XQ Variant, or Serial Matrix emulations.

- Due to the variation in carbonless forms, you should test forms with four or more parts for readability prior to production use. Carbonless forms can be affected by storage and other environmental conditions and should be tested periodically from your application to make sure the output meets your requirements.

- Compatibility differences may exist when replacing or coexisting with older printers, due to technology differences, product and application customization, and emulations.

- The coaxial portion of the IBM Coax/Twinax feature of this printer is subject to the following limitations:

  Minimum dot matrix of 9 wide by 8 high

  Minimum dot matrix of 4 or 7 wide by 8 high

NOTE: The following features are not supported:

  IBM 3287 Models 1C and 2C

  Programmed symbols 2 and 4, 190 character downloadable fonts

  Data analysis = APL feature

  Graphic escape

- The twinaxial portion of the IBM Coax/Twinax feature of this printer is subject to the following limitations:

    Minimum dot matrix of 9 wide by 8 high

    Minimum dot matrix of 4 or 7 wide by 8 high

    Print lines greater than 198 characters

- TN5250 vs. Twinax (Non-IPDS) on the IBM 6400:

    There are few features that may have been available through Twinax (Non-IPDS) that are not supported or are limited under TN5250. Some of the unsupported features are superscript, subscript, and word underscore. Some of the limitations are line density, character selection, and page presentation. This is a partial listing, so it is suggested that you review your jobs to determine which adjustments should be made to accommodate these limitations.

- IBM 6400 vs. 4234 IPDS Comparisons - 4234 Emulation Differences

    The 4234 emulation will not support Load Symbol Sets (LSS)

    The 4234 emulation will use Courier for all Near Letter Quality (NLQ) mode printing, whereas 4234-NLQ mode was Gothic for 13.3, 16.7, and 18 CPI. The dot sizes are different.

    Also, the 6400 has a single dot size vs. three with 4234. For bar code applications, some combinations of unit module width, wide-to-narrow ratio, and element height may affect read rates.

    The 4234 emulation will support image and font resolution of 120 x 144 pel, compared to 144 x 144 pel in the 4234. This will cause images to change size vertically.

- Proportional Space Mode (PSM) is not the same in your new printer. Some differences will occur.

- IBM 6400 vs. 4234 IPDS Comparisons - Differences:

    The 6400 will report Loaded Font command set (LF2) in the Sense Type and Model (STM), but will not support Load Symbol Set (LSS).

    The 6400 will support Page Continuation Actions (PCA) without highlighting.

    The 6400 cannot detect Human Readable Information (HRI) outside of the Bar Code Presentation space under all circumstances.

NOTE: For information on differences between this printer's data stream emulations and other printer data streams, such as the IBM Proprinter III XL, please refer to the *6400 ASCII Programmer's Reference Manual*.

D *Attaching Host Systems to a Coax/Twinax Printer*

Attaching Printer to an iSeries or zSeries Host System

The following information describes how to attach this printer to a zSeries or iSeries System.

If you are installing this printer with the IPDS feature, review the *6400 IPDS Programmer's Reference Manual* for information on attaching a printer to host systems using IPDS.

Attaching Printer to an iSeries Host System

This chapter provides specific instructions on attaching the printer to your computer.

Supported host workstations include:

*   iSeries and System/36

*   5294, 5394, and 5494 Remote Control Units

Attaching Printer to an iSeries with Twinax Interface

 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 of disconnecting communication port, teleport, or attachment cable connector.

Follow these steps:

1. Select a printer address from 0 through 6.

2. From the printer operator panel Twinax Interface menu, make sure the printer address matches the printer address you selected from the table above. You can select addresses ranging from 0 through 6; the default address is 1.

3. If the IPDS feature is not installed, you must choose to emulate either a 5225 or 4234-2 printer from the Twinax Interface menu, under Printer Emulation. The default is 4234-2 printer emulation.

4. If the IPDS feature is installed, you must choose to emulate a 4234-12, from the IPDS menu, under IPDS Emulation Mode. The default is 4234-12 printer emulation. See the *IPDS Programmer's Reference Manual f*or information on the IPDS Emulation Mode values.

5. Turn printer off.

6. Attach the twinax cable from your printer to your host workstation.

7. Turn the printer back on. The iSeries' auto configuration program will query the printer and configure the host system software to recognize the printer.

8. You may want to execute the iSeries Workstation Printer (VFYPRT) Verification Test to make sure the iSeries host system recognizes the printer.

NOTE: If you do not want to use the system printer configuration that is created by the auto configuration program, you can change the printer configuration values as described in the following section.

Changing Your iSeries Printer Configuration

For more information on configuring a printer, see *iSeries Device Configuration Guide* or the online configuration information on the system.

Changing Configuration with Auto Configuration

Auto Configuration can be utilized when either locally or remotely attaching to the system. The printer is configured as DEVTYPE (4234). Other parameters are automatically assigned by the system. See the *iSeries Device Configuration Guide* for more information.

Changing Printer Configuration Settings on iSeries

If you want to change the settings created by iSeries auto configuration, you will need to use the following parameters:

Parameter Description	Parameter	Parameter Setting
Device description	DEVD	Workstation printer name
Device class	DEVCLS	*LCL
Device type	TYPE	*IPDS (When printer is set to 4234-12 mode.)
Device type	TYPE	4234 (When printer is set to 4234-2 mode.)
Device model	MODEL	0000 (00 if IPDS (4234-12) and 02 if SCS (4234-2)) Type can be set to 6408 or 6412. CTA for 6408 or 6412 model.
Advance Function	AFP	*NO (See Note)
Port number Printing	PORT	x
Switch setting	SWTSET	y (Printer station address)
Online at IPL	ONLINE	*YES
Attached controller	CTL	Twinaxial workstation controller name
Font identifier	FONT	zzz (Default font identifier)
Form feed	FORMFEED	* Cont

NOTE: AFP *Yes can be specified if the level of iSeries OS supports the printer as an AFP printer and PSF is installed.

Attaching Printer to Remote Control Unit with Twinax Interface

iSeries auto configuration program does not support remote attached printers. You must manually configure this printer as a remote printer attached to a 5294, 5394, or 5494 Remote Control Unit. Use the following parameters when configuring this printer as a remote printer on iSeries:

Parameter Description	Parameter	Parameter Setting
Device description	DEVD	Workstation printer name
Device class	DEVCLS	*RMT
Device type	TYPE	*IPDS (When printer is set to 4234-12 mode.)
Device type	TYPE	4234 (When printer is set to 4234-2 mode.)
Device model	MODEL	0000 (00 if IPDS (4234-12) and 02 if SCS (4234-2)) Type can be set to 6408 or 6412. CTA for 6408 or 6412 model.
Advanced Function	AFP	*NO (See Note)
Location Address	LOCADR	xx
Online at IPL	ONLINE	*YES
Attached controller	CTL	Remote controller name
Font identifier	FONT	yyy (Default font identifier)
Form feed	FORMFEED	* Cont

NOTE: AFP *Yes can be specified if the level of iSeries supports the printer as an AFP printer and PSF is installed.

Attaching Printer to an IBM System/36 with Twinax Interface

⚠ **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 of disconnecting communication port, teleport, or attachment cable connector.

This section contains instructions for attaching your printer to an IBM System/36. For additional information not found here, see your System/36 documentation.

To connect your printer to a System/36, follow these steps:

1. From the printer operator panel, under Twinax menu, make sure the printer address matches the printer address you selected from the table above. You can select addresses ranging from 0 through 6; the default address is 1.

2. If the IPDS feature is not installed, you must choose to emulate either a 5225 or 4234-2 printer from the Twinax Interface menu, under Printer Emulation. The default is 4234-2 printer emulation.

3. If the IPDS feature is installed, you must choose to emulate a 4234-12 from the IPDS menu, under IPDS Emulation Mode. The default is 4234 printer emulation. See the *IPDS Programmer's Reference Manual for information on the IPDS Emulation Mode values.*

4. Turn off printer.

5. Attach the twinax cable from your printer to your host workstation.

6. Turn the printer back on. System/36's auto configuration program will query the printer and configure the host system software to recognize the printer.

NOTE: If you do not want to use the system printer configuration that is created by System/36's auto configuration program, you can change the printer configuration values as described in the following section.

Attaching Printer to zSeries Systems

It is necessary to define a printer in the zSeries environment to VTAM*, JES2, POWER, PSF, VPS, JES328X Print Facility, NCP, z/VM, z/OS, VSE/ESA and/or other software depending upon your operating environment and printing requirements.

If you are attaching a printer with the IPDS feature installed, review the *6400 IPDS Programmer's Reference Manual* for information on configuring IPDS.

Types of Installation covered for MVS/JES2

Below is a list of configurations covered in this appendix:

- LU1-SCS-Local SNA 3174 Control Unit
- LU1-SCS-Remote SNA 3174 Control Unit
- LU3-DSE-Local SNA 3174 Control Unit
- LU3-DSE Remote SNA 3174 Control Unit
- LU0-DSC-Local Non-SNA 3174 Control Unit

6400-LU1-SCS-Local SNA 3174 Control Unit

LU1-SCS mode is utilized when *neither PSF support nor IPDS is required* to accomplish the print function desired. An existing local 3174 SNA-connected control unit is assumed. The steps required to install a local LU1-SCS printer for host definitions are as follows:

1. Define to VTAM by adding logmode entry to VTAM Logmode Table
2. Define to JES2 (Not required but recommended. See the following details.
3. Define to CICS* or another Application Program such as VPS or JES328X products.
4. Select the options on the printer that are appropriate for the environment.

Step 1 - VTAM Definition

The following should be added to the Local Major Node VTAM definition. The printer will be attached as an LU1-IPDS capable printer.

LOC3174V   BUILD TYPE=LOCAL

LOCPU74   PU   CUADDR=nnn...

LOC6400   LU

LOCADDR=n,MODETAB=MYMODETB,DLOGMODE=6400SCSL,ISTATUS =ACTIVE

The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

6400SCSL MODEENT LOGMODE=6400SCSL,

    FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1',
    SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'8787,
    PSERVIC=X'01000000E100000000000000',
    PSNDPAC=X'02',SRCVPAC=X'02',SSNDPAC=X'00'

Step 2 - JES2 Definition (SYS1.PARMLIB)

RMT1
LUTYPE1,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,NOCM
PCT,

    SETUPHDR,CONSOLE

R1.PR1
CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,F,T/
C,P),

    CKTPAGE=30

DESTID NAME=LOC6400,DEST=R1

Step 3 - Define to CICS or another application program

An application program must provide the SCS commands to control the printer. CICS, VPS, and other applications support SCS as well as numerous application programs, both customer written and vendor supplied. Refer to the vendor documentation for defining an SCS printer to the program for its use. If there is no specific information on the 6400 you may use the IBM 4234 for reference.

Step 4 - Printer Settings

It is recommended that the following printer settings be changed from factory default settings:

• Printer Control => Interface Selection => Coax

• Coax Interface => Format Control => Enable

6400-LU1-SCS-Remote SNA 3174 Control Unit

LU1-SCS mode is utilized when *neither IPDS nor PSF* is needed to accomplish the print function desired. An existing remote 3174 SNA-connected control unit is assumed. The steps required to install a remote LU1-SCS printer for host definitions are as follows:

1. Define to NCP, point to LU1 logmode entry defined below

2. Define to VTAM by adding logmode entry to VTAM Logmode Table

3. Define to JES2 (May not required if VPS. See details below)

4. Define to JES328X Print Facility, VPS, or equivalent product.

5. Select the options on the printer that are appropriate for the environment.

Step 1 - NCP Definition

```
XYZ        GROUP     TYPE=NCP,...
LINK       ADRESS=(032),...
REMPU74  PU          ADDR=C1,...
REM6400   LU          LOCADDR=#,(# replaced by port on control unit)
                      DLOGMOD=6400SCSR,(Default LOGMODE ENTRY NAME)
                      MODETAB=MYTABLE (Table name containing MODEENT)*
```

Step 2 - VTAM Definition

* The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

```
6400SCSR MODEENT LOGMODE=6400SCSR,
    FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1',
    SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6',
    PSERVIC=X'01000000E100000000000000',
    PSNDPAC=X'01',SRCVPAC=X'01'
```

Step 3 - JES2 Definition

This definition is not required if you are using VPS and using U1 - U9999 as the printer ID.

RMT1
LUTYPE1,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,NOCM
PCT,

       SETUPHDR,CONSOLE (SETUPHDR=PDIR JES2 V3)

R1.PR1
CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,F,T/
C,P),

       CKPTPAGE=30

DESTID NAME=P6400,DEST=R1

Step 4 - Define to CICS or another application program

An application program must provide the SCS commands to control the printer. CICS, VPS, and other applications support SCS as well as numerous application programs, both customer written and vendor supplied. Refer to the vendor documentation for defining an SCS printer to the program for its use. If there is no specific information on the 6400 you may use the IBM 4234 for reference.

Step 5 - Printer Settings

It is recommended that the following printer settings be changed from factory default settings:

- Printer Control => Interface Selection => Coax
- Coax Interface => Format Control => Enable

6400-LU3-DSE-Local SNA 3174 Control Unit

LU3-DSE mode is utilized when no host printing controls are required to accomplish the print function desired. The printer settings will be used and cannot be overridden by the host system. An existing local 3174 SNA-connected control unit is assumed. The steps required to install an LU1-DSE printer for host definitions are as follows:

1. Define to VTAM by adding logmode entry to VTAM Logmode Table

2. Define to JES2 (Not required but recommended. See details below)

3. Define to CICS or another Application Program such as VPS or JES328X products.

4. Select the options on the printer that are appropriate for the environment.

Step 1 - VTAM Definition

The following should be added to the Local Major Node VTAM definition. The printer will be attached as an LU1-IPDS capable printer.

```
LOC3174   VBUILD    TYPE=LOCAL

LOCPU74   PU        CUADDR=nnn...

LOC6400   LU

LOCADDR=n,MODETAB=MYMODETB,DLOGMODE=printer,ISTATUS=ACTIVE
```

The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

```
6400DSEL  MODEENT LOGMODE=6400DSEL,

          FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1',

          SECPROT=X'20',COMPROT=X'3080',RUSIZES=X'C7C7',

          PSERVIC=X'038000000000185018507F00'

          PSNDPAC=X'00',SRCVPAC=X'00',SSNDPAC=X'00'
```

Step 2 - JES2 Definition (SYS1.PARMLIB)

```
RMT1
LUTYPE3,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,NOCMPCT,

          SETUPHDR,CONSOLE

R1.PR1
CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,F,T/C,P),

          CKTPAGE=30

DESTID NAME=LOC6400,DEST=R1
```

Step 3 - Define to CICS or another application program

Refer to the vendor documentation for defining a DSE printer to the program for its use. Host system commands to change printer settings are not supported in DSE mode.

Step 4 - Printer Settings

It is recommended that the following printer settings be changed from factory default settings:

- Printer Control => Interface Selection => Coax

- Coax Interface => Format Control => Enable

- Coax Interface => Early Print Complete => Enable

In LU3 mode the printer settings control the orientation, CPI, LPI and all other aspects of the printed output. Therefore, you must set the printer settings to match the characteristics of the job you are printing. Host controls are not supported in this mode.

6400-LU3-DSE-Remote SNA 3174 Control Unit

- LU1-DSE mode is utilized when host controls are not needed to accomplish the print function desired. An existing remote 3174 SNA-connected control unit is assumed. The steps required to install an LU1-DSE printer for host definitions are as follows:

- Define to (NCP point to LU1 default logmode entry defined below)

- Define to VTAM by adding logmode entry to VTAM Logmode Table

- Define to JES2 (May not required if VPS. See details below)

- Define to JES328X Print Facility, VPS, or equivalent product.

- Select the options on the printer that are appropriate for the environment.

Step 1 - NCP Definition

```
XYZ       GROUP    TYPE=NCP,...
          LINK     ADRESS=(032),...
          PU       ADDR=C1,...
&luname   LU       LOCADDR=#, (# replaced by port on control unit)
                   DLOGMOD=6400DSEL,(Default LOGMODE ENTRY
NAME)
                   MODETAB=MYTABLE (Table name containing
MODEENT)*
```

Step 2 - VTAM Definition

* The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

6400DSER MODEENT LOGMODE=6400DSER

           FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1',

           SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6',

           PSERVIC=X'038000000000185018507F00'.

           PSNDPAC=X'01',SRCVPAC=X'01'

Step 3 - JES2 Definition

This definition is not required if you are using VPS and using U1 - U9999 as the printer ID.

RMT1
LUTYPE3,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,NOCMPC ,

           SETUPHDR,CONSOLE (SETUPHDR=PDIR JES2 V3)

R1.PR1
CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,F,T/C,P),

           CKPTPAGE=30

DESTID NAME=P6400,DEST=R1

Step 4 - Define to CICS or another application program

Refer to the vendor documentation for defining a DSE printer to the program for its use. Host system commands to change printer settings are not supported in DSE mode.

Step 5 - Printer Settings

It is recommended that the following printer settings be changed from factory default settings:

•   Printer Control => Interface Selection => Coax

•   Coax Interface => Format Control => Enable

•   Coax Interface => Early Print Complete => Enable

Since the host controls are not supported, the printer settings for CPI, LPI, and others should be set at the printer. See page Setup Guide.

6400-LU0-DSC-Local Non-SNA 3174 Control Unit

LU0-DSC mode is utilized when no host printing controls are required to accomplish the print function desired and the control unit is attached by a VTAM-Controlled NON-SNA Control Unit. An existing local 3174 NON-SNA-connected control unit is assumed. The steps required to install an LU0-DSC printer for host definitions are as follows:

1. Define to VTAM by adding logmode entry to VTAM Logmode Table

2. Define to JES2 (Not required but recommended. See details below)

3. Define to CICS or another Application Program such as VPS or JES328X products.

4. Select the options on the printer that are appropriate for the environment.

Step 1 - VTAM Definition

The following should be added to the Local Major Node VTAM definition. The printer will be attached as an LU1-IPDS capable printer.

LOC3174   VBUILD   TYPE=LOCAL

LOCPU74   PU   CUADDR=nnn...

LOC6400   LU

LOCADDR=n,MODETAB=MYMODETB,DLOGMODE=printer,ISTATUS=ACTIVE

The following entry should be placed in the VTAM MODE TABLE specified above or another of your choice.

6400DSCL MODEENT LOGMODE=6400DSCL,

             FMPROF=X'02',TSPROF=X'02',PRIPROT=X'60',

             SECPROT=X'40',COMPROT=X'0000',RUSIZES=X'C7C7',

             PSERVIC=X'000000000000185018507F00'

             PSNDPAC=X'80',SRCVPAC=X'00',SSNDPAC=X'00'

Step 2 - JES2 Definition (SYS1.PARMLIB)

RMT1
LUTYPE0,BUFSIZE=3840,LINE=1,NUMRD=0,NUMPR=1,NOCOMP,NOCMPCT,

             SETUPHDR,CONSOLE

R1.PR1
CLASS=A,NOSEP,PRWIDTH=132,NOFCBLOD,WS=(W,R,Q,PMD,LIM,F,T/C,P),

             CKTPAGE=30

DESTID NAME=LOC6400,DEST=R1

Step 3 - Define to CICS or another application program

Host commands for changing printer settings are not supported in this mode. Refer to the vendor documentation for defining an DSC printer to the program for its use.

Step 4 - Printer Settings

It is recommended that the following printer settings be changed from factory default setting:

- Printer Control => Interface Selection => Coax

- Coax Interface => Format Control => Enable

- Coax Interface => Early Print Complete => Enable

In LU0 mode the printer settings control the orientation, CPI, LPI and all other aspects of the printed output. Therefore, you must set the printer settings to match the characteristics of the job you are printing. Host controls are not supported in this mode.

Attaching Printer to VM Host System

Below are sample execs you can read in order to help you to understand how to attach this printer to a VM host system:

SNA Attachment

Sample exec file for attaching with SNA protocols:

```
/* Signal JUST_VM */
'CP SMSG VTAMOPX F NET,DEFAULTS,ID=LS6C004,DLOGMOD=LU1PRT'
/* 'CP SMSG VTAMOPX F NET,DEFAULTS,ID=LS6C004,DLOGMOD=LU3PRT'
*/
pull upper pause
'SMSG RSCSCOAX STOP SNA6C004'
'SMSG RSCSCOAX DELET SNA6C004'
'SMSG RSCSCOAX DEFINE SNA6C004 LUNAME LS6C004 TYPE SNA3270P'
/* 'SMSG RSCSCOAX DEFINE SNA6C004 PARM VFC=YES SEP=YES
TR=ASISCC' */
'SMSG RSCSCOAX DEFINE SNA6C004 PARM VFC=YES SEP=NO TR=ASISCC'
/* 'SMSG RSCSCOAX DEFINE SNA6C004 PARM VFC=YES SEP=NO' */
'SMSG RSCSCOAX START SNA6C004 CLASS * QUEUE FIFO FORM *'
JUST_VM:
'CP SPOOL PRINT TO RSCSCOAX'
'CP TAG DEV PRT TO SNA6C004 SYSTEM 1'
'CP TA DE PRT SNA6C004 SYSTEM 1'
```

Non-SNA Attachment

Sample exec file for attaching to a LOCAL 3174 NON SNA port

```
/* Signal JUST_VM    to avoid redefining printer */
'DISABLE XXXX'
'ATT 1601 TO RSCSCOAX AS XXXX'
'SMSG RSCSCOAX STOP PRTXXXX'
'SMSG RSCSCOAX DELET PRTXXXX'
'SMSG RSCSCOAX DEFINE PRTXXXX LINE XXXX TYPE 3270P PARM
BUF=2560'
Use as approriate:
/* 'SMSG RSCSCOAX DEFINE PRTXXXX LINE 1601 TYPE 3270P PARM
COMP=NO' */
/* 'SMSG RSCSCOAX DEFINE PRTXXXX PARM VFC=YES SEP=YES' */
/* 'SMSG RSCSCOAX DEFINE PRTXXXX PARM VFC=YES SEP=NO' */
/* 'SMSG RSCSCOAX DEFINE PRTXXXX PARM VFC=NO SEP=NO TR=ASISCC'
*/
/* 'SMSG RSCSCOAX DEFINE PRTXXXX PARM VFC=NO SEP=NO TR=TEXT
FEAT=AT' */
/* 'SMSG RSCSCOAX DEFINE PRTXXXX PARM VFC=NO SEP=NO ' */
'SMSG RSCSCOAX DEFINE PRTXXXX PARM VFC=NO SEP=NO'
'SMSG RSCSCOAX START PRTXXXX CLASS * QUEUE FIFO FORM *'
JUST_VM:
'CP SPOOL PRINT TO RSCSCOAX'
'CP TAG DEV PRT TO PRTXXXX SYSTEM 1'
'CP TA DE PRT PRTXXXX SYSTEM 1'
```

Physical and Logical Unit Types

This section describes some of the Physical Unit (PU) types and Logical Unit (LU) types that you are likely to use when configuring this printer on your host system. Generally, the PU defines the type of communications relationship that the HOST VTAM has with a communications controller such as a 3174 control unit or a controller inside a printer such as a 3820 or 3935. Alternatively, it can describe the relationship that one host VTAM has to another host VTAM or equivalent, such as an AS/400.

Physical Unit (PU) types and examples

Physical Units, as implied, are part of the physical hardware such as a control unit (3174). VTAM and NCP use various PU types in conjunction with the Logical Unit (LU) types to define the device and logical session to be established with an SNA network.

PU type 2

The PU type 2 is the physical unit type that is required for an LU type 0, type 1, or type 3 (see LU type description following). Examples of PU type 2 are 3174 control units.

PU type 2.1

The PU type 2.1 is the physical unit type that is required for an LU 6.2 (see LU type description following). Examples of PU type 2.1 is an IBM 3820, IBM 3935, or PSF/2.

Summary of LU Types and Representative IBM Products

Listed below are the LU types that SNA currently defines and the kind of configuration or application that each type represents. Also mentioned are hardware or software products that typically use each type of logical unit. A logical unit (LU) describes the type of relationship that the Host VTAM and applications have with a specific device such as a printer. This relationship determines the commands supported from the host to the device and the type of feedback the device gives to the host.

LU type 0

LU type 0 printers are Non-SNA Local or Bisync connections. This mode is also commonly called DSC (Data Stream Compatibility) mode printing. An example of an LU 0 printer connection is an IBM 3816 attached to a non-SNA 3174 control unit. Not all printers support this type connection. This connection type is used when VTAM is controlling the non-SNA control unit and device.

LU type 1

An LU type 1 is for an application program that communicates with single or multiple-device data processing workstations in an interactive, batch data transfer, or distributed data processing environment. The data stream conforms to the SNA Character String (SCS) or Document Content Architecture (DCA). Examples of printers that are able to communicate via LU1 are 4230, 4234, 3930, 6400 and others.

LU type 1 is the basic logical unit type for SCS, IPDS, and AFPDS (PSF) printing. The type of connection is determined by the application that will be driving the printer. The selection is made by changes in the VTAM logmode entry that is used for the logical unit. See the examples for the type of connection desired.

LU type 2

LU type 2 is use by an application program that communicates with a single display workstation in an interactive environment, using the SNA 3270 data stream. Type 2 LU's also use the SNA 3270 data stream for file transfer. An example of an LU type 2 device is a 3270 display such as a 3278, 3178, and others.

LU type 3

An LU type 3 is for an application program that communicates with a single printer using the SNA 3270 data stream. Another name for this connection is Data Stream Extended (DSE). This type of connection will not support the SCS data stream and may be used when no host controls are to be sent to the printer. An example of printers that may use this method of connection are 4230, 3912, 6400, 3930, and others.

LU type 4

LU type 4 is is seldom used today. It is used for (1) an application program that communicates with a single or multiple-device data processing or work processing workstation in an interactive, batch data transfer, or distributed data processing environment (for example, an LU for an application program that uses CICS/VS and communicates with an IBM 6670 Information Distributor); or (2) logical units in peripheral nodes (for example, two 6670's) that communicate with each other. The data stream is the SNA Character String (SCS) for data processing environments and Office Information Interchange (OII) Level 2 (a precursor of DCA) for word processing environments.

LU type 6.1

An LU type 6.1 is for an application subsystem that communicates with another application subsystem in a distributed data processing environment. An example of an LU type 6.1 is an application program that uses CICS/VS and communicates with an application program that uses IMS/VS.

LU type 6.2

An LU type 6.2 supports sessions between two applications in a distributed data processing environment. The data stream is either the SNA General Data Stream (GDS), which is a structure-field data stream, or a user-defined data stream. LU 6.2 session provide communication between (1) two PU type 5 nodes (host resource-owning VTAM), (2) a PU type 5 node and a PU type 2.1 node, and (3) two PU type 2.1 nodes. Examples (1) VTAM-to-VTAM communication, or an application program that uses CICS/VS and communicates with another application program that uses CICS/VS, (2) An application program which uses VTAM and PSF/MVS communicating with an IBM 3820, 3935, or PSF/2; or (3) Two iSeries Host Systems communicating in APPC mode.

LU type 7

An LU type 7 is for an application program and a single display workstation in an interactive environment. An example of an LU type 7 is an application program in an iSeries communicating with a 5250-type terminal. The data stream is the 5250 data stream.

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Zulassungsbescheinigung Gesetz über die elektromagnetische Verträglichkeit von Geraten (EMVG) vom 30. August 1995

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen das EG-Konformitätszeichen - CE - zu führen. Verantwortlich für die Konformitätserklärung nach Paragraph 5 des EMVG ist die IBM Deutschland Informationssysteme GmbH, 70548 Stuttgart.

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 55022 Klasse A und EN 50024.

EN 55022 Klasse A Gerdte müssen mit folgendem Warnhinweis versehen werden: Warnung: dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen öerursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.

EN 55024 Hinweis:
Wird dieses Gerät in einer industriellen Umgebung betrieben (wie in EN 55024 festgelegt), dann kann es dabei eventuell gestört werden. In solch einem Fall ist der Abstand bzw. die Abschirmung zu der industriellen Störquelle zu öergrvßern.

Anmerkung:
Um die Einhaltung des EMVG sicherzustellen sind die Geräte, wie in den Handbüchern angegeben, zu installieren und zu betreiben.

Glossary

A to D	Analog to Digital
active	The horizontal location on the paper where the next character will print. After printing a character, the printer advances the active column.
active line	The vertical location on the paper where the next character will print. After printing a line, the printer advances the active line.
active position	The position on the paper where the next character will print. The active position is defined by the horizontal position (active column) and the vertical position (active line).
ACK	(Positive) acknowledge. Affirmative or acknowledge.
ASCII	American Standard Code for Information Interchange. A standard character encoding scheme introduced in 1963 and used widely on many computers and printers. It is a 8-bit code with 256 different bit patterns. There is no parity recommendations.
attributes, print	Operations performed on text that alter its appearance but do not change the font. Examples: underlining, superscripting, bold, etc.
bar code	A printed code consisting of parallel bars of varied width and spacing and designed to be read by a one-dimensional scanning device.
baud	A unit of speed that measures the rate at which information is transferred. Baud rate is the reciprocal of the length in seconds of the shortest pulse used to carry data. For example, a system in which the shortest pulse is 1/1200 second operates at 1200 baud. On RS-232 serial lines, the baud rate equals the data flow rate in bits per second (bps). To communicate properly, a printer must be configured to operate at the same baud rate as its host computer.
bold	A print attribute specifying text of a heavy line thickness. **This sentence is bold**. See also **character weight**.
buffer	A reserved area in memory where data is written and read during data transfers.

bus	A circuit for the transfer of data or electrical signals between two devices.
character cell	The invisible rectangular space occupied by a character, including the white space around the character. The height of a cell remains constant even with changes in the current line spacing, and the width is equal to the current character spacing. Used as a unit of spacing.
character proportion	The ratio of character height to character width. See also **compressed** and **expanded**.
character set	A set of codes, each of which represents a printable character, including symbols, punctuation, numbers, diacritical markings, and alphabet characters. Each character is assigned a unique code value.
character weight	The degree of lightness and thickness of printed text. For example: **Bold** refers to a heavy or thick character weight. Medium, normal, or book weight refer to the character weight used in this sentence.
checksum	A stored or transmitted numerical value used to verify data integrity.
Code V	An optional QMS emulation which allows you to create and store forms, generate logos, bar codes, and expanded characters, create other graphics, and merge graphics with alphanumeric data as a document is printed.
command	An instruction, such as a form feed command, sent from a computer to the printer (sometimes called a control code or non-printable character). As opposed to data, which is information to be printed.
command delimiter	An ASCII character used to begin a command string (same as SFCC). Commonly used command delimiters are ESC (1B hex) and SOH (01 hex).
command sequence	Two or more bytes that instruct the printer to perform a special function. The first character in the sequence is a special function control character (SFCC), which alerts the printer that the string is a command sequence. See also **escape sequence**, **SSCC**, and **SFCC sequence**.
compatibility	The ability of one printer to accept and properly process commands meant for a different printer. See also **emulation** and **protocol**.
compressed	Refers to a typeface with a font width approximately 60% smaller than normal. Character height is not changed.

configuration	Refers to the operating properties that define how the printer responds to signals and commands received from the host computer at the printer interface. These properties are called configuration parameters and must be set to match the operating characteristics of the host computer system.
controller	An independent logic unit in a data processing system that controls data paths between the central processing unit and one or more units of peripheral equipment.
cpi	Characters per inch. A unit of measurement of monospaced fonts indicating the horizontal density. For example, 10 cpi means 10 characters can be printed in one horizontal inch.
cps	Characters per second. A measurement of the print speed of a serial (character) printer.
CPU	Central Processing Unit
CR	Carriage Return
CT0	Abbreviation for Coax/Twinax only. A model available in a previous generation of the IBM Line Matrix Printer.
CTA	Abbreviation for Coax/Twinax/ASCII.
CTS	Clear To Send
CVFU	Abbreviation for Centronics direct access Vertical Format Unit.
DAVFU	Abbreviation for Direct Access Vertical Format Unit. Also known as NVFU. See also **NVFU**.
DC	Data Controller
DCD	Data Carrier Detect
decipoint	One tenth of a point. A unit of length equal to 1/720 inch. See also **point**.
default	A value, parameter, attribute, or option that is used by a program or system if another is not specified by the user.
descender	The portion of a printed, lowercase character that appears below the base line. For example, "g," "j," "p," "q," and "y" are characters with lowercase descenders.
diagnostic	Pertaining to the detection and isolation of a printer malfuction or mistake.
disable	To deactivate, make "false" (0) or set to OFF.
DP	Abbreviation for data processing print. This is a mid-quality, mid-speed print resolution.
draft	A limited dot font used for rough copy. Low print quality but fast print speed.
DRAM	Dynamic Random Access Memory
DSR	Data Set Ready
DTR	Data Terminal Ready

DVFU	Abbreviation for Dataproducts direct access Vertical Format Unit.
EBCDIC	Extended Binary Coded Decimal Interchange Code.
EC	Engine Controller
ECMA	European Computer Manufacturers Association.
EIA	Electronic Industries Association
Elite	A name indicating a monospaced font with a pitch of 12 cpi (and usually 10 points in height).
em	A unit of measure in typesetting. The width of a piece of type about as wide as it is tall. (Derived from uppercase M, usually the widest character in a set.)
EM	End of Message (3287 only)
emulation	The ability of a printer to emulate, or function like a different type of printer. See also **compatibility** and **protocol**.
en	A unit of measure in typesetting equal to half the width of an em.
enable	To activate, make "true" (1), or set to ON.
escape sequence	A command sequence in which the first byte is always the ASCII ESC character. See also **command sequence**, **SSCC**, and **SFCC sequence**.
ETX	End of Text
EVFU	Abbreviation for Electronic Vertical Format Unit. Relates to the ability to slew (skip quickly as a specified number of lines).
expanded	Refers to a typeface with a font width larger than normal. Character height is not changed.
family (or type)	A set of all variations and sizes of a type style.
FF	Form Feed
FIFO	First In, First Out
fixed-pitch fonts	Same as FONT, MONOSACED.
FM Header	Format Header. Command strings used to switch between SCS and IPDS.

font	The complete set of a given size of type, including characters, symbols, figures, punctuation marks, ligatures, signs, and accents. To fully describe a font, you must specify seven characteristics:

1. typeface (Courier, Helvetica, Swiss, etc.)
2. spacing (proportional or monospaced)
3. type size (12 point, 14 point, etc.)
4. scale factor (character height/width ratio)
5. type style (Roman or italic)
6. character weight (bold, normal, etc.)
7. character proportion (normal, compressed, expanded).

font, monospaced	Also called fixed-pitch font and mono-font. Every character, regardless or horizontal size, occupies the same amount of font pattern space. All monospaced fonts use specific pitch size settings. Monospaced fonts are sometimes used when strict character alignment is desired (tables, charts, spreadsheets, etc.).
font name	see typeface.
font pattern	A font pattern is the matrix of pixels which represents a character, symbol, or image.
font, proportional	A font in which the width of a character cell varies with the width of the character. For example, "i" takes less space to print than "m." Using proportional fonts generally increases the readabilty of printed documents, giving text a typeset appearance.
font weight	The thickness of the lines making up a character. For example, "bold" and "light" are different font weights.
font width	The measurement of the width of a character cell in dots.
gateway	A hardware device that translates data between two incompatible networks.
gateway address	The IP address of a gateway.
hammer	The hammer spring with a hammer tip mounted onto it.
hammer spring	The flat piece of metal, made of spring steel, which supports and pushes the hammer tip.
hammer tip	The small, round point, located near the end of the hammer spring, which strikes the ribbon and leaves a dot on the paper.
hex codes	Based on a numeral system with a radix of 16.
host (computer)	The computer that stores, processes, and sends data to be printed, which communicates directly with the printer. The term "host" specifies the controlling computer, since modern printers are themselves microprocessor-controlled computer systems.

HS	Abbreviation for high speed font. Also referred to as draft.
HT	Horizontal Tab
Hz	Hertz. Cycles per second, a measure of frequency.
IGP	Intelligent Graphics Processor. An optional emulation that converts graphics commands received from the host computer to binary plot data that is usable by the printer.
initialization	A series of processes and self-tests to set power-up defalt conditions and parameters.
interface	The hardware component used to line two devices by common physical interconnection, signal, and functional characteristics.
invoke	To put into effect or operation.
IP Address	The Internet Protocol Address. A numeric address such as 123.45.61.23 which identifies a printer or server in a LAN or WAN.
IPDS	Intelligent Printer Data Stream
ipm	Abbreviation for inches per minute. A measure of the speed of a printer printing in graphics print mode (plotting speed).
italic	A slanted type style. This is an italic type style. Both forward and backward slant are available.
LAC	Load Alternate Characters
LF	Line Feed
landscape	Printed perpendicular to the paper motion.
LCD	Liquid-crystal display. The LCD is located on the operator panel. Its purpose is to communicate information to the operator concerning the operating state of the printer.
LED	Light Emitting Diode. The printer operator panel has LEDs that indicate the state of the printer to the operator.
logical link	The parameters that specify data transfer, control, or communication operations.
lpi	Abbreviation for lines per inch. A measurement indicating the vertical spacing between successive lines of text. For example, 8 lpi means eight lines of text for every vertical inch.
lpm	Abbreviation for lines per minute. A measurement of the print speed of a line printer printing in text print mode.
monospaced	See **font, monospaced**.
MM	Millimeter
MPL	Maximum Page Length. Also known as forms length. The number of lines that can be printed on a page.
MPP	Maximum Print Position. Also known as line length. See also **PMPP**.

NAK	Negative acknowledge. Not acknowledged.
N/A	Not available or not applicable.
NL	New Line (3287 only).
NLQ	Abbreviation for near letter quality font. This is the highest resolution mode supported on the 6400.
Not Ready Mode	Offline. The printer is not ready to receive and process commands and data.
nS	Nanosecond
NVFU	Direct Access Vertical Format Unit. See also **DAVFU**.
NVRAM	Abbreviation for non-volatile random access memory. The storage is permanent, in the sense that information is not lost when the printer is powered off.
OCR	Abbreviation for Optical Character Recognition. A process by which a machine can "read" characters printed in a special standardized font. Data are read by a photoelectric optical scanner and can be recorded on magnetic tape or disk. OCR-A and OCR-B are two widely used OCR fonts.
Ohm	A unit of measurement for electrical resistance.
PA	Program Attention. Used in application programs.
parity (check)	Parity checking is the addition of non-data bits to data, resulting in the number of bits that are set to a "1" being either always even or always odd. Parity is used to detect data errors.
PC	Personal Computer
PCBA	Printed Circuit Board Assembly
pel	The smallest element of a physcial medium that can be independently assigned color and intensity. Pels per inch is often used as a measurement of presentation granularity. Synonymous with picture element, pixel.
PI	Abbreviation for Paper Instruction. A physical hardware I/O line used in conjunction with the eight data bit lines. When PI is set high, it indicates that the eight data bits are interpreted as a paper motion command instead of printable data.
pica	A name indicating a monospaced font with a pitch of 10 cpi (and usually 12 points in height). Pica is also used in typography as a unit of measurement equal to 1/6 inch.
pitch	The number of text characters printed per horizontal inch. Specified in characters per inch or cpi.
pixel	Derived from picture (PIX) ELement. The smallest displayable picture element on a video monitor or printable unit. In printing, a pixel is a dot.

PMPP	Physical Maximum Print Position. The longest line teh printer is capable of printing. This differs from MPP in that the printer may be capable of printing lines 132 characters wide (PMPP), but the print job is only 80 characters wide (MPP). See also **MPP**.
point	A unit of length in printing and typography, used to specify type sizes, heights of font characters, etc. There are 72 points in a vertical inch; thus, one point equals 1/72 inch, or approximately 0.0139 inch. Some examples of point sizes are: This is 8 point type. This manual is printed in 10 point type. This is 14 point type.
POR	Power On Reset
port	A channel used for receiving data from or transmitting data to one or more external devices.
portrait	Printed parallel to the paper motion.
print mode	Font
proportion, character	See **character proportion**.
proportional	See **font, proportional**.
protocol	The rules and conventions that govern communication between a printer and a host computer. A protocol includes codes for printing text and graphics and codes instructing the printer to perform special operations. See also **compatibility** and **emulation**.
RAM	Random Access Memory. Can be read from or written to at any time. RAM is volatile; whatever information is in RAM is lost when power is removed or interrupted.
RD	Receive Data
read	To retrieve data from memory or from mass storage (hard disk, floppy diskette, etc.)
Ready mode	Online. The printer is ready to receive and process commands and data.
reset	To turn off, deactivate, disable, or return to a previously determined state.
resolution	A measure expressing the number of component units in a given range used to create an image in print. Expressed as the number of dots per inch (dpi) horizontally and vertically.
ROM	Read Only Memory. Programs, instructions, and routines permanently stored in the printer that cannot be written to. Information in ROM is not lost when power is turned off. (ROM-resident fonts are fonts permanently stored in a printer and available at any time via software commands to the printer.)

Roman	An NLQ type style in which the characters are upright and the edges of the characters have a serif. This sentence is printed in a Roman type style.
RTS	Request To Send
SA	Set Attribute
SAA	Systems Application Architecture
sans serif	An NLQ type style in which the characters are upright and blocked. This sentence is printed in a sans serif type style.
SCS	System Network Architecture (SNA) Character String. Usually commands to set printer format, etc.
serial communication	
	The sequential transmission of data, in which each element is transferred in succession.
set	To turn on, activate, invoke, or enable.
SFCC sequence	Special Function Control Character sequence. Two or more bytes that describe a specific printer control function. The first byte is always the SFCC. This also applies to IGP options.
shuttle	The subassembly in a line matrix printer that includes the hammer bank assembly, plus some or all of the drive mechanism.
size, type	See **point**.
SLD	Set Line Density
slew	Rapid vertical paper movement.
SNA	Systems Network Architecture
SOH	Start Of Header
spacing	See **font**, **proportional** and **font, monospaced**.
SSCC	SuperSet Control Character. See **escape sequence** and **command sequence**.
start bits	In serial data transfer, a signal indicating the beginning of a character or data element.
stop bits	In serial data transfer, a signal indicating the end of a character or data element.
string	Two or more bytes of data or code treated as a unit.
style, type	See **type style**.
subnet mask	A binary value used to divide IP networks into smaller sub-networks or subnets. This mask is used to help determine whether IP packets need to be forwarded to other subnets.
symbol set	See **character set**.
TCB	Task Control Block
TD	Transmit Data

TOF	Top Of Form
TTL	Transistor-Transistor Logic
type family	See **typeface**.
type size	See **point**.
type style	Refers to either the upright or italic character style in a specific font family. Roman is upright, *italic is slanted.*
typeface	A descriptive name or brand name that identifies a particular design of type. Examples are Courier, Helvetica, and Swiss. Also called type family.
typographic font	See **font, proportional**.
UPC	Universal Product Code
USET	Abbreviation for User-defined Set. An IGP command that creates custom character sets (except OCR fonts) from existing characters stored in memory.
VFU	Abbreviation for vertical format unit.
warm start	An almost complete reset of the printer:
	a. Data are cleared from all buffers.
	b. All internal system variables are reset to default (host set).
	c. Selected power-up configuration is loaded.
weight	See character weight.
write	To store data to memory (RAM) or to mass storage (hard disk, floppy diskette, etc.).

Index

Numerics

A

B

N

R

S

T

U

V

W

Z

Readers' Comments — We'd Like to Hear from You

IBM 6400i Setup Guide

Publication No. S544-5640-04

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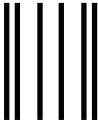
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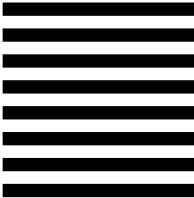
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