

# **User's Guide**

Form Number G544-5731-00

SHIPPING INSTRUCTIONS:

INSTRUCTIONES DE TRANSPORTE:

VERSANDHINWEISE:

INSTRUCCIONES DE TRANSPORTE:

ISTRUZIONI PER IL TRASPORTO:

INSTRUCTIONS D'EXPEDITION:

REMOVE MEDIA AND RIBBON BEFORE MOVING OR SHIPPING PRINTER.

REMOVA O MEIO DE IMPRESSAO E A FITA ANTES DE DESCLOCAR OU TRANSPORTAR A IMPRESSORA.

ENTFERNEN SIE MEDIUM UN FARBBAND BEVOR SIE DEN DRUCKER TRANSPORTIEREN ODER VERSENDEN.

RETIRAR EL MATERIAL Y LA CINTA ANTES DE MOVER O TRANSPORTAR LA IMPRESORA.

RIMUOVERE LA CARTA E IL NASTRO PRIMA DISPOSTARE O SPEDIRE LA STAMPANTE.

RETIRER LE SUPPORT ET LE RUBAN AVANT DE DEPLACER OU DE RENVOYER L'IMPRIMANTE.



# **User's Guide**

#### **ENERGY STAR**



The EPA ENERGY STAR\*\* Computers program is a partnership effort with manufacturers of data processing equipment to promote the introduction of energy-efficient personal computers, monitors, and printers, and to reduce air pollution caused by power generation.

IBM participates in this program by introducing printers that reduce power consumption when they are not being used. This feature can cut energy use by up to 50 percent.

Note: The ENERGY STAR emblem does not represent EPA endorsement of any product or service.

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## **Communication Notices**

**Federal Communications Commission (FCC) Statement:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provided reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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**The United Kingdom Telecommunications Statement of Compliance:** This apparatus is approved under the approval No. NS/G/1234/J/100003 for the indirect connections to the public telecommunications systems in the United Kingdom.

**New Zealand:** Warning - This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Japanese VCCI:



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Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu furhren.

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This product has been tested and found to comply with limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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(Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

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#### **Electrical Safety**

This printer is inspected and listed by recognized national testing laboratories, such as Underwriters Laboratories, Inc. (UL) in the U.S.A. and Canadian Standards Association (CSA) in Canada. Listing of a product by a national testing laboratory indicates that the product is designed and manufactured in accordance with national requirements intended to minimize safety hazards. IBM equipment meets a very high standard of safety in design and manufacture. Remember, however, that this product operates under conditions of high electrical potentials and heat generation, both of which are functionally necessary.

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**NOTE:** Before using the information and the product it works with, make sure that you read the general information under "Notices."

First Edition (April 2000)

This edition applies to the IBM Thermal Printer.

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Table of Contents

# 1

# Introduction

# **Notes and Notices**

For your safety and to protect valuable equipment, it is very important that you read and comply with all information highlighted under notes and notices:



<#> 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 4400 Safety Notices* booklet.



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



<#> The word Caution next to this symbol indicates a heavy assembly that requires two or more persons to lift or hold.

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<#>

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



<#>

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.

#### **Requesting IBM Service**

Follow the actions in the troubleshooting tables in chapter 5, Diagnostics and Troubleshooting. Most problems can be easily resolved using these tables. If you are unable to resolve the problem, you may want to request service from your IBM service team. To request service on your IBM 4400 Series Thermal Printer in the U.S. or Canada, call 1-800-358-6661. Service is available from 8 a.m. to 8 p.m. eastern time. To request service in other countries, call your countryCall Center.

You may call for service free of charge during the printer's warranty period. You can obtain service after the warranty period has expired if you sign a service contract agreement with an authorized service provider.

You also can obtain service on a billable-per-call basis after the warranty period has expired. Please have your service contract information and printer serial number available when you call. The four digit machine type is 4400. Please enter this number when prompted.

**NOTE:** Technical support is also available from the IBM Printing Systems Division home page at: http://www.printers.ibm.com

#### **Printing Conventions in This Manual**

Operator panel keys and LCD messages are set off from regular text in this manual:

- Operator panel keys and indicators are printed **boldface.** Example: Press the **Cancel** key, then press the **Pause** key.
- Liquid Crystal Display (LCD) messages are printed in capital letters inside quotation marks ( " " ).

Key combinations are denoted by the + (plus) symbol. Example: Press  $\uparrow + \downarrow$ means *Press the Up*  $\uparrow$  *key and the Down*  $\downarrow$  *key at the same time.* 

## The 4400 Thermal Label Printer

**NOTE:** As used in this manual, the terms "4400" and "printer" refer to all models within the 4400 series.

The printer series consists of a family of high quality, direct thermal and thermal transfer printers specifically designed for printing labels and tags, from any MS-DOS<sup>\*\*</sup>, Windows<sup>\*\*</sup>, ASCII or EBCDIC (with the Coax/Twinax option) based compatible computer.

The IBM thermal printer series is comprised of the products detailed in Table 1.

Model	Max Print Speed (ips)	Printing Density (dpi)	Max Print Width (inches)
4400-004	10	203	4.1
4400-004	8	300	4.1
4400-006	10	203	6.6
4400-006	8	300	6.6
4400-008	8	203	8.5
4400-008	6	300	8.5

Table 1. The IBM thermal printer Series

#### **Features**

- Thermal transfer and direct thermal printing.
- Supports over 20 types of bar codes.
- Download forms, fonts and graphics to printer memory.
- High resolution printhead for sharp graphics and text.
- Built-in label rewinder for label Peel-Off operation.
- Label Taken Sensor for detecting removal of labels in Peel-Off or Tear-Off modes.
- Peel-Off mode for peeling off labels one at a time, before printing the next label.
- Tear-Off mode for positioning the label at the tear-off position and detecting its removal before printing the next label.
- Tear-Off Strip mode for printing a specified number of labels and positioning the last label at the tear-off position.
- 8MB DRAM memory (4MB for the 4400-004).
- 4MB Flash memory.

Dynamic Print Control provides exceptional print quality. A circuit monitors the data to be printed and automatically adjusts the energy applied to the thermal printhead for maximum performance.

The printer can be connected to communicate with the host via RS-232 and RS-422 serial, Centronics<sup>\*\*</sup>-compatible parallel, IEEE<sup>\*\*</sup> 1284 compliant parallel, and, optionally, coax/twinax host connections or Ethernet<sup>\*\*</sup> 10/100 Base-T. The interface cable needed to connect the printer to the host device is supplied by the user.

# **Thermal Printer Technology**

Quiet and fast, with excellent print quality, the IBM multifunction thermal printer uses an inline thermal printhead. The operation of a thermal printer is different from that of a line-matrix or laser printer. The thermal printer uses a printhead with heating elements and special paper or ribbon.

#### **The Printing Process**

The thermal printhead allows two modes of operation:

Direct Thermal

During *direct* thermal printing, the thermal printhead selectively heats small, rectangular *thermal* dots. When these contact the coated thermal paper, the dyes and developers in the coating react to the heat and develop an image. This mode of printing is generally used for short-term labeling applications.

#### Thermal Transfer

During thermal *transfer* printing, the heated thermal dots contact a thermal ribbon. The heat reacts with the ribbon and bonds the image to the paper. This method is used especially for abrasive, long-storage applications and for specialized applications, such as in extreme environmental conditions or where tamper-proofing is required.

#### **Dynamic Print Control**

The thermal printer has a unique feature that provides excellent print quality by preventing unevenness of print density. Unevenness is usually caused by the stored heat from previous dots. Print quality largely depends on how the thermal paper or the thermal ribbon and thermal transfer paper responds to the heat of the thermal printhead.

During printing, the thermal printhead must reach a set temperature in the shortest possible time. Then it must cool down to the original temperature in the shortest possible time after printing. Thus print quality is dependent on the precise control of the energy supplied to the thermal dots.

The Dynamic Print Control is a method for predicting the quantity of heat required to print dots based on the results of the previous printing. This prevents unevenness of print density and results in the printing of narrow-ladder bar codes or vertical grid lines that are straight from the microscopic viewpoint.

# **Thermal Consumables**

#### **Media Selection**

Since there are two print modes of operation, there are two kinds of thermal media:

- Direct thermal media
- Thermal transfer media

Direct thermal media is paper coated with special chemicals that act as an accelerator, acceptor dye and binder. During direct thermal mode, the heat from the thermal printhead contacts the paper and causes a chemical reaction to take place.

There is a wide range of thermal transfer media available, such as film or synthetic paper substitutes that are excellent in their ability to transfer an image (print quality) and others in scratch resistance (long storage). Most of these media options can be die-cut for easy label applications.

**NOTE:** The term "media" used in this manual refers to all the different kinds of paper or tag stock that can be used in the printer.

#### Ribbons

IBM offers a wide range of ribbons that have been specifically engineered to enhance printing capabilities and to prevent premature printhead wear. Therefore, it is strongly recommended that you use a Genuine IBM Thermal Ribbon in your printer.

#### IBM 4400 TTW Thermal Transfer Ribbon

This ribbon provides superior print quality on coated and uncoated thermal transfer paper, labels and tags. IBM 4400 TTW ribbons are an excellent choice for general-purpose applications.

#### IBM 4400 TTB Thermal Transfer Ribbon

This ribbon provides excellent high-speed print quality with premium durability and performance on a wide range of thermal transfer paper and synthetic labels. IBM 4400 TTB ribbons are formulated to provide excellent print quality at the highest IBM 4400 print speeds.

#### IBM 4400 TTR Thermal Transfer Ribbon

Specifically designed for use with high-end synthetic labels. Provides the highest heat, chemical, and abrasion resistance where toughness and label durability are needed.

#### Ordering Ribbons (U.S. Only)

Ribbons may be purchased from Lexmark Authorized IBM Supplies Dealers or directly from Lexmark by calling: **1-800-438-2468** 

#### Fax orders may be sent to: 1-800-522-3422

Mail orders may be sent to: Lexmark International, Inc., 1221 Alverser Drive, Midlothian, VA 23113.

Ordering Ribbons (Outside of U.S.)

Order supplies by contacting your local Lexmark International distributor or by writing to Lexmark International, Inc.

Lexmark International, Inc. P.O. Box 11427 Lexington, KY, 40575-1427 USA

## **Thermal Features**

#### **Emulations**

The 4400 has the standard IBM ASCII Emulation which provides direct compatibility with IBM series printers. In addition, the printer has co-resident IGP and Code V emulations which provide printer system commands for text, barcodes, graphics, lines, and boxes.

### **Hardware Options**

Ask your IBM representative about the following options, which can enhance the versatility of your printer.

• Memory Expansion

16MB DRAM SIMM - Provides additional memory to accommodate long label formats.

Coax/Twinax Host Interface

Provides connection to an IBM host computer system using a coax or twinax interface.

• Ethernet\*\* 10/100 BASE T

Allows the user to attach the printer to a LAN (Local Area Network) rather than attaching it directly to a host system. This Ethernet Interface server supports 10/100 Base T (UTP) only and is mounted inside the printer.

# **Setting Up The Printer**



<6>

The printer weighs between 15.9 kg (35 lb.) and 22.7 kg (50 lb.). Use two persons to carry the printer. Use appropriate lifting precautions.

#### **Unpacking The Printer**

The printer is shipped in a carton and protective bag. Keep all packing material in case you need to move or re-ship the printer. Avoid touching the electrical connectors to prevent electrostatic discharge damage while setting up the printer.

- ATTENTION The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead or electronic components used in this device.
- **ATTENTION** Damage to the printer interface connector may result from placing the printer on its backside during unpacking or handling.



Open the media cover by lifting it in the center of its bottom right edge.



1) Media Cover

Remove the tape securing the liner rewinder clamp to the rewinder spindle. Slide the Media Hanger Guide outward to the end of the Media Hanger. Place the Guide in the down (horizontal) position and remove the sample roll of ribbon and media from the media hanger and set them to one side.

#### **Check List**



Your thermal printer kit contains the items listed below.

- The thermal printer.
- AC Powercord
- User's Manual
- Quick Reference Manual
- Printer Manual CD
- Terminating Resistor Packs
- Ribbon Take-Up Core (mounted in printer)
- Starter Kit Roll Media
- Sample Roll of IBM Thermal Transfer Wax Ribbon (wrapped inside media roll)
- Printhead Cleaning Pen (wrapped inside media roll)

NOTE: If any items are missing, contact your dealer for replacement parts.

#### Installation

The following sections will guide you through the installation of the printer.



<6> The printer should never be operated in a location where the operator or printer can get wet.

- 1. Place the printer in a suitable location on a flat level surface that allows easy access to all sides of the printer. The printer should never be operated while resting on its side or upside down.
- 2. Check that the printer power switch is in the OFF (O) position.



Legend:

- AC Power Receptacle
  On/Off Power Switch





<4> Do not connect or disconnect any communication port, teleport, attachment connector, or power cord during an electrical storm.

The following sections will guide you through the installation of the printer.

- 3. Attach Interface
  - a. Parallel Interface

Attach a suitable parallel printer cable from the computer to the Centronics interface connector at the back of the printer. Snap the bail locks to the Centronics connector to secure the interface cable to the printer.



b. Serial Interface

Attach a suitable serial printer cable from the computer to the DB-25 RS-232 Serial interface connector at the back of the printer. For additional information on serial cable wiring, refer to "Diagnostics and Troubleshooting" on page 175.



**NOTE:** The printer supports simultaneous connection of the Parallel and Serial interfaces using the Auto Switching feature. See Auto Switching described on page 165.

If your printer is equipped with the Coax/Twinax and ethernet interfaces, the rear I/O panel will look like the picture below.



c. Coax Interface

Attach a suitable coaxial cable from the computer to the coax connector located in the I/O plate in the back of the printer.



d. Twinax Interface

Attach a suitable twinax cable from the computer to the twinax connector located in the I/O plate in the back of the printer.



e. Ethernet Interface

Insert a suitable ethernet cable from your hub or switch to the ethernet connector located in the I/O panel in the rear of your printer.





4. Attach the AC power cord to the AC power receptacle in the rear of the printer.

Attach the AC power cord to a grounded (three prong) electrical outlet of the proper voltage.





<1>

Before powering on the printer, ensure that the printer is plugged into the appropriate power source.

2 *Operation* 

# **Using The Printer**

## **Controls & Indicators**



All printer controls and indicators, except for the power switch and ONLINE status indicator, are located on the front panel of the printer. The power switch is located in the bottom left hand corner at the rear of the printer. The ONLINE status indicator is located on top of the printer, directly above the control panel.

The Control Panel is located at the top left of the printer. The panel has a back-lighted Liquid-Crystal Display (LCD) with 2 rows of 16-characters each. The Control Panel also contains the printer control keys. A summary of each key's function is provided on the following pages. Detailed descriptions of key functionality are provided in Chapter 3.

Button	Description	Function in Online Mode	Function in Offline Mode	Function in Menu Mode
PAUSE	<b>PAUSE Key</b> Toggles the printer between online and offline modes.	Sets printer to Offline Mode.	Sets printer to Online Mode.	Sets printer to Offline Mode.
	JOB SELECT Key Decrement Key	None	Selects a pre-stored printer configuration.	Decrements values in the current menu selection, or navigates through selections to the left.
	FEED Key Up Key	Advances the media one form length.	Advances the media one form length.	Navigates the current menu selection one level up.
	<b>TEST PRINT Key</b> Pressing the → (Enter) key with a Diagnostic Test displayed initiates the test. Pressing the → (Enter) key again terminates the test.	None	Navigates the Test Print pattern.	Increments values in the current menu selection, or navigates through selections to the right.
+	Increment Key			

Chapter 2

Using The Printer

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Button	Description	Function in Online Mode	Function in Offline Mode	Function in Menu Mode
×	Cancel Key This key is set to disable from the factory, except when the Coax/ Twinax option is present. In this case, the factory default setting is enable. CANCEL can also be enabled in the PRINTER CONTROL menu. Down Key	Clears all data in the printer data buffer when enabled.	Clears all data in the printer data buffer when enabled.	Navigates the current menu selection one level down.
	Menu Key	Sets the printer to Offline and selects the Menu mode.	Selects the Menu mode.	Navigates between top level menu selections.
ł	<b>Enter Key</b> If the $\downarrow$ (Enter) key is locked, the value will not be selected and an "ENTER SWITCH LOCKED" message displays for one second, followed by a display of the previously selected value. Pressing the $\downarrow$ (Down) and $\downarrow$ (Enter) keys unlocks the $\downarrow$ (Enter) key and permits value selection. After unlocking the $\downarrow$ (Enter) key, it is then used to select the desired value.	None	None	Selects the current menu value and displays an asterisk (*) next to the value.

#### The POWER Switch and Indicator



The printer's POWER SWITCH is located on the back panel of the printer, in the bottom left corner. Placing this switch in the ON (|) position applies power to the printer. Place this switch in the OFF (O) position to remove power when you have finished using your printer. An illuminated LCD Message Display indicates the printer power is ON.

#### **Powering On The Printer**

When you power on the printer, it executes a self-test. The default power-up state is online. Once the printer has successfully initialized, the ONLINE status indicator light illuminates, and the LCD indicates the communication interface selected and the type of emulation installed.

If there is a fault during the self-test, the ONLINE status indicator flashes, and a fault message appears on the display. The alarm may also sound, if it is configured to do so.

#### **Operating Modes**

**Online** - In online mode, the printer can receive and print data sent from the host. Pressing the PAUSE key toggles the printer between the online and offline mode. The ONLINE status indicator is lit in online mode.

**Offline** - In offline mode, you may perform operator functions, such as loading media, or navigating through the printer configuration menu to make changes or verify option settings. Pressing the PAUSE key toggles the printer from offline to online mode. The ONLINE status indicator is not illuminated in offline mode.

**Fault** - In fault mode, a fault condition exists that must be cleared before printing can continue. The ONLINE status indicator flashes, the alarm beeps (if configured to do so) and a descriptive fault message displays.

The current operating mode can be selected through the control panel keys, or may result from routine operations such as powering on the printer.

## Loading Media and Ribbon

This section explains how to load roll media, fanfold media, and the ribbon. The term "media" used in this manual refers to all the different kinds of paper, label, or tag stock material that can be printed on by the printer.

Your thermal printer can print on continuous paper, adhesive backed labels or non-adhesive tags packaged in roll or fanfold form.

ATTENTION DO NOT TOUCH the Printhead or the electronic components under the Printhead Assembly. The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the printhead or electronic components used in this device.

**IMPORTANT** Adhesive backed labels that DO NOT lay flat on the backing liner may jam the printer. This can cause the label to peel off the liner. The exposed edges may stick to the label guides and rollers inside the printer.

If you run out of labels while printing, do not turn the power switch to the OFF position while reloading labels. Lost data may result. Prior to printing labels, it is also recommended you enable the Error Recover sub-menu of the MEDIA CONTROL menu, and save it as the power-on default. Error Recover forces the printer to automatically reprint a label that may have been partially printed prior to the PAPER OUT fault message, after additional labels are properly loaded.
# Loading Roll Media

- 1. Open the media cover.
- 2. Slide the media hanger guide outward to the end of the media hanger, and rotate it downward to a horizontal position.



- Media Hanger Guide Media Hanger 1)
- 2)



3. Open the pivoting deck by rotating the deck lock lever clockwise to the end of its travel. The pivoting deck will swing open.

- 1) 2)
- Pivoting Deck Deck Lock Lever



4. Slide the media width guide located on the media damper outward to the fully extended position.

Legend:

- 1) 2)
- Media Damper Media Width Guide

- 5. Slide a roll of media over the media hanger guide and onto the media hanger. The media feeds from the top of the roll and towards the front of the printer.
- 6. Push the roll to the back of the media hanger, rotate the media hanger guide to its upright position and slide it inward against the outer edge of the media roll.



- 1) 2) 3) Media Roll Media Hanger
- Media Hanger Guide

7. Thread the media under the media damper and then between the platen (drive roller) and the printhead. You can also refer to the arrows on the printer frame or the Ribbon and Media Loading instruction label inside the media cover.



- Printhead Assembly Platen (Drive Roller) Media Damper 1)
- 2) 3)

#### Chapter 2 Loading Media and Ribbon

- 8. Push the media width guide inward until it is flush with the outer edge of the media.
- 9. Check the location of the TOF (Top-of-Form)/Paper Out sensor (it is blue in color and located just behind the platen), and refer to Top-of-Form Sensor Horizontal Adjustment on page 56.



Legend:

1) Media Width Guide

10. Close the printhead by pressing down on both sides of the front of the pivoting deck and rotating the deck lock lever counterclockwise against its stop. This locks the pivoting deck and printhead assembly into the printing position.



Legend:

- 1) Pivoting Deck
- 2) Deck Lock Lever

#### ATTENTION Ensure the pivoting deck is down and locked before attempting to print. Failure to do so will cause a premature failure of the printhead assembly.

11. For direct thermal operation (no ribbon required) close the media cover and go to step 12.

For thermal transfer operation (use of ribbon) complete the ribbon loading procedure (See "Loading Ribbon" on page 48).

Verify that Print Mode in the Printer Configuration Menu is set for the media type installed (Direct or Transfer). The Print Mode submenu is located in the MEDIA CONTROL Main Menu. See "Menu Options" on page 76 for details.

- 12. Press the FEED key once to verify that the media advances.
- 13. Press the PAUSE key to place the printer online. The printer is now ready for printing.

## Loading Fanfold Media

- 1. Open the media cover.
- 2. Slide the media hanger guide outward to the end of the media hanger, and rotate it downward to a horizontal position.
- 3. Remove any roll media.
- 4. Place the fanfold media either behind or beneath the printer, depending on the desired fanfold supply location. Insert the first few labels through either the rear or bottom panel opening.
- 5. Place the media over the media hanger, flush against the back of the printer.
- 6. Rotate the media hanger guide to its upright position and slide it inward against the outer edge of the loaded media.



- 1) Media Hanger Guide
- 2) Media Hanger
- 3) Fanfold Media

- 7. Rotate the fanfold tension arm down by pushing on it through the opening at the top of the media hanger guide.
- 8. Open the pivoting deck by rotating the deck lock lever clockwise to the end of its travel. The pivoting deck will swing upward.



- 1) 2) 3) Fanfold Tension Arm Pivoting Deck Deck Lock Lever

- 9. Slide the media width guide outward to the end of the media damper.
- 10. Thread the media between the platen (drive roller) and the printhead. You can also refer to the Ribbon and Media Loading instructions label inside the media cover. The inner edge of the media should be positioned as far inward as possible.
- 11. Slide the media width guide inward against the outer edge of the media.
- 12. Check the location of the TOF/Paper Out sensor, and refer to "TOF/Paper Out Sensor Horizontal Adjustment" on page 56. The TOF/Paper Out sensor is blue in color and located just behind the platen.



- 1) Printhead Assembly
- 2) Platen
- 3) Media Width Guide

13. Close the printhead by pressing down on both sides of the front of the pivoting deck and rotating the deck lock lever counterclockwise against its stop. This locks the pivoting deck and printhead assembly into the printing position.

Verify that Print Mode in the Printer Configuration Menu is set for the media type installed (Direct or Transfer). If Thermal Transfer media is installed, see "Loading Ribbon" on page 48. The Print Mode submenu is located in the MEDIA CONTROL Main Configuration menu. See "Menu Options" on page 76 for more information.



#### Legend:

- 1) Pivoting Deck
- 2) Deck Lock Lever

#### ATTENTION Ensure the pivoting deck is down and latched before attempting to print. Failure to do so may cause a premature failure of the printhead.

- 14. Press the FEED key once to verify that the labels advance.
- 15. Close the printer media cover if the thermal transfer operation is not needed.
- 16. Press the PAUSE key to place the printer online. The printer is now ready for printing.

#### Loading Ribbon

#### Skip this section when using Direct Thermal Printing

- 1. Slide the appropriate thermal transfer ribbon supply roll onto the ribbon supply spindle until it is flush against the printer.
- 2. Open the pivoting deck by rotating the deck lock lever clockwise to the end of its travel. The pivoting deck will swing upward.
- 3. Thread the end of the transfer ribbon below the rear ribbon guide and continue threading between the platen (or media, if loaded) and the printhead. You can also refer to the arrows on the printer frame or the Ribbon and Media Loading Instruction label located inside the printer on the media cover.



- 1) Pivoting Deck
- 2) Platen
- 3) Deck Lock Lever4) Rear Ribbon Guide
- 4) Rear Ribbon Guide5) Ribbon Supply Spindle
- 6) Ribbon Supply Roll

4. Wrap the transfer ribbon from the front of the printhead assembly to the front side of the ribbon take-up spindle. Attach the ribbon to the take-up core (fiberboard tube) on the ribbon take-up spindle with tape.

When installing a new roll of ribbon, attach the ribbon leader adhesive strip to the ribbon take-up core. Manually rotate the spindle clockwise to feed the unusable portion of the ribbon leader around the take-up spindle.

**NOTE:** Do not attach the ribbon to the ribbon take-up spindle without a core installed. Proper ribbon tension and ribbon removal is based on use of fiberboard core.



- 1) Ribbon Take-up Spindle
- 2) Ribbon Take-up Core
- 5. Close the pivoting deck (see page 47).
- 6. Close the printer media cover if the rewinder is not needed.
- 7. Verify that Print Mode is set for Transfer in the Print Mode submenu located in the MEDIA CONTROL Main Configuration menu. See "Menu Options" on page 76 for more information.
- 8. The printer is now ready to print.

# **Print Option**

## Label Peel Off

The printer can be set up to automatically peel off labels from the backing liner and dispense them one at a time while rewinding the liner. This configuration requires routing the liner through the rollers on the Peel/Tear assembly properly and use of the printer's internal rewinder.

- 1. Open the media cover.
- 2. Open the front cover.
- 3. Open the pivoting deck by rotating the deck lock lever clockwise to the end of its travel. The pivoting deck will swing upward.
- 4. With the label stock already loaded and exiting from the front of the printer (see "Loading Roll Media" on page 37), separate the labels from their liner (about 20 inches worth).







5. Thread the liner over the tear bar behind the top roller and around the outside of the bottom of the Peel/Tear assembly.

#### Chapter 2 Print Option

- 6. Manually position the leading edge of the first label to just behind the tear bar of the Peel/Tear assembly.
- 7. Thread the liner counterclockwise around the rewinder and the rewinder clamp as shown, and insert the liner end into one of the slots in the rewinder. Make sure the rewinder clamp is pushed in against the rewinder.
- 8. With one hand holding the liner in the slot, use the other hand on the rewinder clamp and rotate the rewinder counterclockwise until the lever is taught on the rewinder spindle.



- 1) Rewinder Clamp
- 2) Rewinder

- 9. Verify the leading edge of the first label is still behind the tear bar of the Peel/Tear assembly.
- 10. Close the printhead by pressing down on both sides of the front of the pivoting deck and rotating the deck lock counterclockwise against its stop. This locks the pivoting deck and printhead assembly into the printing position.
- 11. Close the front door. The door must be closed for the Label Sensor to first sense the label and then its removal.



- 1) **Plvoting Deck**
- 2) Label Only
  3) Deck Lock Lever
- 12. For automatic label peel-off mode, set Media Handling to Peel-Off under the MEDIA CONTROL Main menu. See Chapter 3 for more information on configuring the printer.
- 13. Close the media cover.

# **Printing Adjustments**

# **Printhead Pressure Adjustment**



Legend:

1) Printhead Pressure Adjustment Dial

Adjustment of the printhead pressure is sometimes required to obtain optimum printing results with variations in media thickness and width. The printhead pressure adjustment dial is shown above.

In general, the printhead pressure should be adjusted to the minimum value which produces the desired print quality. Following this procedure will help to minimize printhead wear. The numbers on the Printhead Pressure Adjustment Lever are relative only and do not indicate a specific printhead pressure.



## **Printhead Pressure Block Adjustments**

Legend:

- 1) Left Pressure Block
- 2) Left Pressure Block Handle
- 3) Pressure Block Adjustment Scale
- 4) Right Pressure Block
- 5) Right Pressure Block Pointer
- 6) Lead Screw Knob

The Printhead Pressure Pad Adjustments are used to obtain best printing results under a variety of media and ribbon conditions.

Under normal printing conditions, the optimum position of the left pressure block when its handle detent is positioned in the notch in the pivoting deck. If media/ribbon widths of less than one-third the printer's maximum printing width are used, it may be necessary to move the left pressure block further left by using the handle and overriding the detent. The left pressure block can only be moved manually using its handle.

The proper setting for the pressure blocks is when they are evenly spaced across the width of the media. The proper setting for the right pressure block is with the right pressure block pointer positioned on the right edge of the media in use. The right pressure block is adjusted by turning the Lead Screw Knob located in the right side of the pivoting deck.

To check the correctness of the pressure block positions, print the grey test pattern (see the DIAGNOSTICS/Printer Tests menu item). The pressure blocks should then be positioned to obtain a uniform printing density across the media. In most cases, only the right pressure block will need adjustment.

#### Label Variations and the TOF/Paper Out Sensor

Your printer is equipped with a sensor that is used to detect the TOF (Top-of-Form) position as well as a paper out condition. Depending on the type of media used, the sensor will either "see through" the label liner, index hole or notch in the media (*Transmissive* sensing) or detect a black horizontal stripe on the media with reflective label backing (*Reflective* sensing). In either case, the correct option must be selected under the Gap Sense item in the MEDIA CONTROL Main Menu. When Transmissive is selected, the TOF position is based on the trailing edge of the gap, notch, or hole. When Reflective is selected, the TOF position is based on the leading edge of the black stripe.

A third option, None, is also available under the Gap Sense item in the MEDIA CONTROL menu. The None option must be selected when continuous media with no gap, notch hole, or black stripe is installed. The TOF will be based on the Label Length value set under the Media Control menu or by the Forms Length command sent via host computer software.

**NOTE:** When Gap Sense = None, Calibrate should still be performed to automatically establish the optimum Paperout Threshold value.

#### **TOF/Paper Out Sensor Horizontal Adjustment**

In order to accurately detect the gap, hole, notch or narrow width black stripe, the Top-of-Form sensor can be moved along the width of the media from the inner media edge to within .65 inches from the maximum media width or the right side. The position of the sensor is changed by using the handle at the back of the sensor to slide the sensor to the desired position. The actual location of the sensor is indicated by the notch located in the center in the sensor visible when the pivoting deck is in the open position.

In the Transmissive Mode, the sensor should be located directly under the inter-label gap, hole or notch, while in the Reflective mode it should be positioned as close as possible in the middle of the width of the label black stripe. For media with no gap and no black stripe, the sensor should be set under the media to detect a paperout condition.

When using the TOF/Paper Out sensor, it is the responsibility of the user to adhere to the media specifications described in Appendix A of this manual and to ensure that the Label Length value set in the MEDIA CONTROL Main Menu (or Label Length value sent via software command) matches the physical length of the label or tag stock installed in the printer. In addition, the operator should perform the TOF sensor Calibrate procedure described below whenever a different type of media sensing will be required (Transmissive or Reflective), when installing never-before-tried media, or when the printer is experiencing loss of TOF position. Loss of Top-of-Form is usually followed by a fault message on the LCD, such as "GAP NOT DETECTED See Manual" or "PAPER OUT Load Paper."

### Calibrating the TOF/Paper Out Sensor

Due to manufacturing differences in media, the TOF (Top-of-Form)/Paper Out sensor may have difficulty distinguishing the difference between the label and the liner (gap) or the label and the black stripe or a paperout condition. When this occurs, the printer will display an error message on the LCD such as "GAP NOT DETECTED See Manual" or "PAPER OUT Load Paper." The printer's sensitivity for detecting the TOF position or paper out condition of the media installed can be optimized by using the Calibrate feature of the printer.

TOF/Paper Out sensor sensitivity can be improved by changing the values of Paper Calibrate/Gap Threshold and/or Paper Out Threshold. These values can be changed manually within the MEDIA CONTROL menu, or can be determined by the printer automatically by performing the Calibrate procedure.

Any changes to sensor parameters which occur as a result of the Calibrate procedure, regardless if performed automatically or manually, take effect immediately within the current configuration menu, but are not automatically saved. If the Calibrate is performed again the new values will overwrite the previous values for the current menu.

The new values can be saved into non-volatile memory (menus 1-8 only) by using the Save Configuration procedure. If the current menu in use is the Factory menu, the values will take effect but will not be saved into memory and will be lost when the printer is powered off.

When Paper Calibrate has completed successfully, the Sensed Distance selection in the MEDIA CONTROL menu will display a distance in inches based on the media type in use:

- transmissive media = the label length plus one gap length
- reflective media = the distance from the leading edge of one black stripe to the leading edge of the next black stripe.

The Sensed Distance value can not be changed manually and is updated only as a result of the Paper Calibrate procedure. The factory default value of Sensed Distance is 0.00 inches.

If Calibrate fails to determine the proper values and ends with a fault message displayed (GAP NOT DETECTED or LOAD PAPER), you can either try it again or manually change the Gap Threshold and/or Paper Out Threshold values under the Media Control/Paper Calibrate menu.

Once the correct values are determined and the Label Length setting in the MEDIA CONTROL menu is equal to or slightly less than the physical label length, press the FEED key to advance media and determine if it consistently stops at the correct TOF position each time.

#### **Calibrate Procedure**

Calibrate is enabled via the front panel by using the Menu Key and navigating through the MEDIA CONTROL menu or by using the Test Print Key.

The Test Print Key requires the fewest key strokes to begin the Calibrate, but the user must still navigate through the MEDIA CONTROL menu to view the results regarding value changes to the Gap Threshold, Paper Out Threshold, and Sensed Distance.

**NOTE:** Verify that the media installed in the printer matches the MEDIA CONTROL menu Gap Sense option (Transmissive, Reflective, or None).

Verify that the Top-of-Form sensor is horizontally positioned to permit sensing of the notch, gap, or black stripe. (See "TOF/Paper Out Sensor Horizontal Adjustment" on page 56.)

#### Running Calibrate via the MEDIA CONTROL Menu

- 1. Press and release the PAUSE key to place the printer Offline.
- 2. Press and release the ↓ and ↓ keys simultaneously to unlock the printer menu. "ENTER SWITCH UNLOCKED" appears on the LCD.
- 3. Press the  $\equiv$  key until "MEDIA CONTROL" appears on the LCD.
- 4. Press the  $\downarrow$  key until "Paper Calibrate/Run Calibrate" appears.
- 5. Press the  $\dashv$  key. The media will advance approximately 11 inches.

The procedure is completed successfully if no fault is displayed and the Sensed Distance value is correct (See "Sensed Distance" on page 98). Sensed Distance value will be updated only when Gap Sense = Transmissive or Reflective. When Gap Sense = None, only Paper Out Threshold will be updated.

If a fault message such as "GAP NOT DETECTED See Manual" or "PAPER OUT Load Paper" appears while performing the Paper Calibrate procedure, press the PAUSE key and perform the Calibrate procedure again.

- 6. Press the PAUSE key until "OFFLINE" appears on the LCD.
- 7. Press the FEED key. The media should advance one forms length.
- **NOTE:** If Clip Page = Enable (factory default) in the MEDIA CONTROL menu, the printer will stop at the first TOF (Top Of Form) position of the transmissive gap, notch, or hole, or reflective black strip that it detects. This is regardless of the Label Length value selected under the MEDIA CONTROL menu.

If Clip Page = Disable in the MEDIA CONTROL menu and the Label Length value is longer than the physical label length of the media in use, the printer will continue to advance media to achieve that Label Length value and then stop at the next TOF position.

8. Press the PAUSE key to place the printer Online.

**NOTE:** The amount of media advancement is also based on which Media Handling selection is enabled under the MEDIA CONTROL Main menu. 'Tear-Off' and 'Tear-Off Strip' will advance the media until the Top-of-Form of the next label is positioned over the Tear bar. When 'Continuous' Media Handling is selected the media will advance only until the Top-of-Form of the next label is positioned under the printhead.

#### **Running Calibrate Via The Test Print Key**

- 1. Press and release the PAUSE key to place the printer Offline.
- 2. Press the Test Print Key until Printer Test/Calibrate appears on the LCD.
- 3. Press the ↓ key. The media will advance approximately 11 inches.

The procedure is completed successfully if no fault is displayed and the Sensed Distance value is correct (See "Sensed Distance" on page 98). Sensed Distance value will be updated only when Gap Sense = Transmissive or Reflection. When Gap Sense = None, only Paper Out Threshold will be updated.

- 4. Press the PAUSE key until "OFFLINE" appears on the LCD.
- 5. Press the FEED key. The media should advance one forms length.
- **NOTE:** If Clip Page = Enable (factory default) in the MEDIA CONTROL menu, the printer will stop at the first TOF (Top Of Form) position of the transmissive gap, notch, or hole, or reflective black strip that it detects. This is regardless of the Label Length value selected under the MEDIA CONTROL menu.

If Clip Page = Disable in the MEDIA CONTROL menu and the Label Length value is longer than the physical label length of the media in use, the printer will continue to advance media to achieve that Label Length value and then stop at the next TOF position.

The amount of media advancement is also based on which Media Handling selection is enabled under the MEDIA CONTROL Main menu. 'Tear-Off' and 'Tear-Off Strip' will advance the media until the Top-of-Form of the next label is positioned over the Tear bar. When 'Continuous' Media Handling is selected the media will advance only until the Top-of-Form of the next label is positioned under the printhead.

6. Press the PAUSE key to place the printer Online.

# Cleaning

Depending on the media used, the printer may accumulate residues (media dust, adhesives, etc.) as a by-product of the normal printing process. To maintain top printing quality, these residues should be removed by a periodic cleaning of the printer.

#### General

Periodic cleaning should be performed on all rollers, guides, and assemblies. Low pressure air can be used to remove dust in the printer. Isopropyl alcohol and a cotton swab should be used to clean any areas where media dust, adhesives, etc. have accumulated. This general cleaning will insure that all parts are free of residue which may degrade print quality.

The media path and printhead should be cleaned each time a new roll of media is installed in the printer.

## **Printhead**

As you use your printer, the printhead may become dirty resulting in poor print quality. You should clean the printhead when replacing the ribbon or installing new media.Clean the printhead with the printhead Cleaning Pen supplied with the printer. The printhead heating elements (light brown area) is most important. Keeping your printhead clean will help to maintain its life. 1. Rotate the deck lock clockwise to open the pivoting deck and remove any media and ribbon (if loaded) to gain access to the printhead assembly heating element area.



Legend:

- 1) Pivot Deck
- 2) Deck Lock Lever



2. Gently rub the felt tip of the Cleaning Pen or a cotton swab with Isopropyl alcohol across the printhead heating elements (light brown area).

Allow the printhead to dry for one minute before reloading the labels.

## Chapter 2 Cleaning

# Configuring the Printer

## **Overview**

The configuration process is done using the printer configuration keys on the control panel and includes the following:

- Configuring the printer for different host interface options
- Customizing label formats
- Checking printer status
- Running various maintenance tests
- **NOTE:** Control codes sent by the host system will override the control panel settings.

# **Menu Navigation**

This section explains how to use the control panel to change individual settings and save them as a customized configuration. For details on the control panel keys and how they work, see "Controls & Indicators" on page 31.

Pressing ↓ and ↓ together unlocks or locks the printer menu (offline mode only) and permits value selection. This is the default key combination for locking/unlocking the printer. You can change the key combination. See "Set Lock Key" on page 101.

#### **Setting Printer Configuration Parameters**

Configuration parameters are set from the control panel or are retrieved from the printer's memory. The parameters define how the printer will respond to command and interface signals from the host computer.

The configuration menu structure consists of top-level menus and various parameter selections under each top-level menu.

**NOTE:** Many of the selectable configurations refer to printer options or features that may or may not be present in your printer. Selecting an option or feature that is not present will result in no action being performed by the printer, or an 'OPTION NOT INSTALLED' message displayed.

#### Moving Within the Configuration Menu

Movement within the configuration menus is controlled by using the appropriate navigation keys. Figure 1 shows how to move through the menu system. See "Controls & Indicators" on page 31, for more details on the function of the operator panel keys.) This example configures the printer for Direct Thermal operation.

Figure 2 is a configuration printout of a typical printer. This printout illustrates some of the possible parameter selections which can be made from either the printer configuration menu or a host computer.

Figure 3 shows the top level overview of the menu structure. A brief description of the function of each top-level menu selection is given below each top-level menu selection.

Figure 4 shows a more detailed view of the top level of the menu system. Not all possible top-level menu selections are available simultaneously since their presence depends on the installed options as well as specific selections made in other areas of the menu system.

Use these basic guidelines to move throughout all the configuration menus.

You can select different options and save them as the power on default; however, they can only be saved to configurations menus 1-8, as the factory configuration menu can not be altered or saved over.

When the printer is online, the first line of the LCD indicates ONLINE and the second line lists the active interface port and type of emulation.

To configure the printer, it must be offline. If the ONLINE indicator is lit, press and release the PAUSE key to place the printer offline. When the printer is offline, OFFLINE appears on the top line of the LCD. Pressing the := key causes the printer to enter the printer configuration menu system and CONFIG. CONTROL appears on the next line. When in the printer configuration menu system the LED indicator is illuminated.

Step	Press	LCD	Notes
1.	PAUSE	OFFLINE	
2.	↓ & ↓	ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
3.	i	OFFLINE CONFIG. CONTROL	Enables the printer configuration menu.
4.	:=	OFFLINE MEDIA CONTROL	Selects the MEDIA CONTROL top level menu.
5.		Print Mode Transfer*	
6.	<b>+</b> or <b>-</b>	Print Mode Direct	Cycle through the choices.
7.	₊	Print Mode Direct*	Selects the Direct transfer mode.

Figure 1. Moving within the Configuration Menu

### **Selecting a Menu Option**

By default, the  $\downarrow$  key is "locked" when the printer is turned on. The purpose of this is to prevent accidental changes to the configuration menu. If you press the  $\downarrow$  key when the key is locked, the message ENTER SWITCH LOCKED is displayed on the LCD for one second, and the value will not be selected.

To unlock the  $\dashv$  key, press the  $\downarrow$  and  $\dashv$  keys simultaneously. This toggles the enter lock function.

If this function is performed while the  $\rightarrow$  key is locked, the message ENTER SWITCH UNLOCKED will be displayed for one second, and the ENTER key will be unlocked.

If this function is performed while the  $\dashv$  key is unlocked, the message ENTER SWITCH LOCKED will be displayed for one second, and the  $\dashv$  key will be locked.

When the  $\downarrow$  key is pressed (with the  $\downarrow$  key unlocked), the value displayed is entered and the configuration is changed immediately.

**IMPORTANT** This change takes effect for all subsequent data and operations for the printer as soon as ENTER Key is pressed and the asterisk (\*) is displayed. The configuration change(s), stay in effect only while the printer is powered on. When the power is turned off, all current configuration will be lost unless changes made to it are saved via the CONFIG. CONTROL menu.

To save configuration information permanently or to select it as the power-up default, see "Saving a Configuration" on page 68.

### **Changing Printer Settings**

Changing printer settings, such as print speed or emulation, is referred to as configuration. Configure the printer through the control panel.

1. Make sure the printer is offline. If the ONLINE indicator is lit, press the PAUSE key to enter the offline mode. The following message will display:

OFFLINE	

2. Press = key until the following message displays.



- 3. Press  $\uparrow$  or  $\downarrow$  to cycle through these options:
- Print Intensity
- Print Speed
- Slew Speed
- Print Mode
- Ribbon Select
- Media Handling
- Paper Feed Shift
- Gap Sense
- Label Length
- Label Width
- Ver Image Shift
- Hor Image Shift
- Orientation
- Ribbon Width
- Paper Calibrate (Run)
- Paper Calibrate (Gap Threshold)
- Paper Calibrate (Paper Out Threshold)
- Sensed Distance
- Auto Map Select
- Auto Label Width
- Num Auto Labels
- Tear Strip Time
- Clip Page
- Error Recover
- Display Ribbon
- Ribbon Low
- Units

- 4. When the menu item displays, press the + or key and hold to scroll through the possible selections.
- 5. Press the → key to select a value. An asterisk (\*) displays next to the selected value.
- 6. If there are more values you want to change, use the i \_\_\_\_, ↑, ↓, +, and keys to access the value and the ↓ key to select it. At any time, you may press the i \_\_\_\_\_ key to return to the top level menu.
- 7. At any time, you may press the PAUSE key twice to exit the configuration menu and place the printer online. Once you have finished selecting all your options, save your configuration.

# **IMPORTANT** If you do not save your configuration, all your new values will be lost when you turn off the printer.

# **Configuration Options**

## Saving a Configuration

You can save up to eight different configurations to meet eight unique print job requirements. For example:

- Factory: Factory Default (This cannot be altered.) Config. 1: Selects IEEE 1284 Parallel Interface
- Config. 1: Selects IEEE 1284 Parallel Interface Selects Label Width of 4 inches Selects Label Length of 24 inches Selects Hor Image Shift of 0.20 inches, etc.
- Config. 2: Selects Centronics Parallel Interface

Selects Label Width of 2.2 inches

Selects Page Label Length of 25.0 mm

Selects Ver Image Shift of 0.10 inches, etc.

The configurations are saved and stored in non-volatile memory for later use. These configurations, including the factory default configuration, will not be erased from memory when the printer power is turned off.

If you do not save your configuration (to the non-volatile memory) before you turn off the printer, any changes made to that current configuration will be lost.

**NOTE:** If the Protect Configs. option is enabled, the new configuration will not be saved unless the existing configuration has been deleted.

Follow these steps to save a new configuration:

 Make sure that the printer is offline. If the ONLINE indicator is lit, press the PAUSE key to take the printer offline. Press the \_\_\_\_\_ key until the following message displays:

OFFLINE CONFIG. CONTROL

2. Press the  $\downarrow$  key until the following message displays:

Save Config. 1\*

- 3. Press the or + key to cycle through the options (1-8). Note that the factory default configuration is not listed.
- 4. When the desired number displays, press → to select it. The following message displays briefly:

Saving Configuration When processing is completed, the display shows:



**NOTE:** If the configuration number has been previously saved and the Protect Configs. option is enabled under CONFIG CONTROL, the following error message displays:

CONFIG. EXISTS
Delete First

If the above occurs, see "Modifying a Saved Configuration" on page 69, step 4.

It is recommended that you print your configuration and store it in a safe place for future reference. Refer to "Printing a Configuration" on page 71.

## Modifying a Saved Configuration

You can change a saved configuration by rewriting over it. For example, you can modify Config. 1, shown below. Suppose you want to keep all the settings but you want to select the parallel Centronics interface instead of the IEEE 1284 interface.

Config. 1: Selects IEEE 1284 Parallel Interface Selects Label Width of 4 inches Selects Label Length of 24 inches Selects Hor Image Shift of 0.20 inches, etc.

- 1. Load the configuration to be changed (for example, Config. 1).
  - a. Make sure that the printer is offline. If the ONLINE indicator is lit, press the PAUSE key to take the printer offline. Press the \_\_\_\_\_ key until the following message displays.

OFFLINE CONFIG. CONTROL

b. Press the  $\downarrow$  key until the following message displays.

Load Config. Factory

- c. Press the + or key to cycle through the options: Factory 1-8.
- d. When the desired number displays, press the *⊢* key to select it. The following message is displayed while loading.

Loading Saved Configuration Then, the following message displays when it is loaded:

	X*	Load Config.
--	----	--------------

- 2. Move through the menu and change all the desired values. (In this example, under Parallel Port, you would change the value from IEEE 1284 to Centronics.)
- 3. Press the  $\dashv$  key to save each new value. An asterisk (\*) displays.
- 4. Before saving the modified configuration, you must delete the original configuration if the Protect Configs. option is enabled.
  - a. Press the  $\uparrow$  or  $\downarrow$  key until the following message displays:



b. Press the + or - key to cycle through the options (1-8). When the desired number displays, press the → key to select it. The following message is displayed.

Deleting Configuration

Then, the following displays when it is deleted:

Delete Config. X\*

- 5. Save the new configuration as described in the "Saving a Configuration" on page 68. Make sure you select the same number (e.g., Config. 1) when saving the modified configuration. The new configuration writes over the existing one.
- 6. Print a copy of this newest configuration and store it in a safe place. Refer to the "Printing a Configuration" on page 71.

## Printing a Configuration

It is recommended that you print and store your configurations for future reference. The printout provides a list of the parameters that were set when you configured the printer. A sample configuration printout is shown in Figure 2.

To print a configuration:

 Make sure the printer is offline. If the ONLINE indicator is lit, press the PAUSE key to take the printer offline. Press the \_\_\_\_\_ key until the following message displays.



2. Press the  $\downarrow$  key until the following message displays:



3. Press the + or - key to cycle through the following printout options.

- 4. When the desired option displays, press the → key. The printer prints the specified configuration. Refer to Figure 2, for a sample configuration printout.
- **NOTE:** If the configuration you want to print has not been saved, the following message will display momentarily:



This message indicates that no configuration menu has been saved under the configuration value you have selected and therefore cannot be printed. You must either select another configuration to print or load and then save a configuration to that configuration value first.

MEDIA CONTROL Print Intensity -3 Print Speec 6 1ps Slew Speed 10 (ps Print Mode Transfer Ribbon Select Printromix 8500 Media Handling Paper Feed Shift Continuous 0.00 Inches Gap Sense None Label Length 06.0 Inches Label Width 08.5 Inches Ver Image Shift 0.00 Inches Non Image Shift O NO Inches Orientation Portrait Ripbon Width Same as Paper Paper Colibrate Run Calibrate Paper Calibrate Gab Thresh- 171 Paper Calibrate Pap Out TH: 250 Sensed Distance 0 00 inches Auto Map Select Disable Auto Label Width 08.5 inches Num Auto Labels 2 labels lear Strip Time 1 seconds Clip Page Frable Error Recover Disable Display Ribbon Enable Ribbon Low D1sab1e Units In Inches PRINTER CONTROL LP+ Emulation P-Series Active IGP Emul CGP/PGL Power Saver Time 15 minutes Olsplay Language English Alarm 0п Power up State Online Ptx Setup SFCC 21r Overwrite Files Fnable View File List 93779.61 177228 Sytes 93962.51 91409 st 90993.sf 92250.sf plugin.com hq3uDdt.cdm pluginfp cdm ۰f.fnt hq3.frt ulf.ss plugin.tef utt.ss amacats: fls ameca fls version network.det ptsLogo.ger Optimize&Reboot Print Frie List Cancel Key Compalibility Disable Default Advanced User Disable IGP/PGL SETUP Character Group Stendard Sets O) ASC1: Arabic Secs Cyrille Sets European Sets Greek Seta Nebrew Sets lunkish Sets Select (P: 6 Define CR Code CR = CRDefine LF Code LF - LF

210124 Bytes 47218 Bytes 47856 Bytes 59792 Bytes 722066 Dytes 53480 Bytes 206161 Bytes 339 Bytes 444 Bytes 21646 Hytes 26928 Bytes 15180 Sytes 22123 Bytes A2127 Bytes 61 Bytes 97 Bytas 18788 Bytes Standard Sets ASM0 447 Code Page 866 Latin 2 8859-2 DEG 256 Greek Hearew Qld Data Gen Purk.

Figure 2. Sample Configuration Printout (sheet 1 of 3)
Autowrap Disable Auto Uppercase Disable Slash D D1sab1e Select SFCC 126 P-SERIES SETUP Select CPT 10.0 CPC Select LP: 6.0 LPT Letter Gathic Scandard Bets Typeface Character Group Character Set IBM PC Anable Sets ASM0 449 Cyrillic Sets Cyn111 id: 866 Latin 2 885% 2 European ...ets Greek Sets DEC 256 Greek Hebrew Set: Hebrew Old luckish Set: Cata Gen Turs Primery Sub: ct ASCIT (USA) Mu tinational ASCIT (USA) Primary Subsit DEC Mult. ASCIT (USA) ASCTL (USA) Extended Subsct Code Page 437 Extended Subser Multinetional Forizontal DP1 120 001 72 DP1 Ventical DPC Frop. Spacing Italic Print Enable Disable Slashed Zero D1sable Left Pargin 0 characters Right Margin 0 characters Top Mangin 0 l'nespaces Sottom Margin 0 11 mesparses Print Char Set De‴ne CR code CR = CRDisable LF = CR + LF Auto F Define LS code P SER XQ SETUP Select CPT 10.0 CPI Select LPT (.0 LP: Letter Gothur Type face Horizonta' OPI 120 OP: Vertical DPT 72 DP1 Prop Spening Shab) e Icallo Print O(sable Dissole Slashed Zero Left Margin 0 characters Right Hangin 9 inaracters Top Mangin > Unespaces Botron Mangin 0 | nespaces Print Char Set Define (R code (R – C9 Auto LF Lisatie Define LF code SER MATRIX SETUP  $\mathsf{L}_{-} = \mathsf{CR}_{-} + \mathsf{LF}_{-}$ Select CP1 10.0 CPC Select LPI 6 D LP. Typeface Character Group Letter Sothic Stancar: Sets Character Set CBM P.1 Anabio Sets ASM0 419 Cyrillic Sets Cyr111°c 366 Latin 2 8'59-2 European Sets Greek Sats DEC 266 Graek Hebrew Sata Hebrew G d Turkish Sets Data Gen. urk. Primary Subset ASC11 (US+1 Multinational Primary Subset ASC11 (USA ASCIL (USA DEC Mult. ASCII (LSA) Exianded Subset Code Page 417 Extended Subset Multinationa Horizonte) DP1 120 DP1 Vertical DP1 72 DP1 Prop. Spacing Enable Italic Print D'sable Slashed Zero Drisab1e Left Margin C characters Right Nargin O characters Top Mangin Bottom Mangin 2 linespaces > Innespaces Print Char, Set Define CR code Auto L<sup>r</sup> Define LF code CR - CR Ensole L! = LI

Figure 2. Sample Configuration Printout (sheet 2 of 3)

PROPRINGLE SETUP 10 0 CP1 Select CP1 Select \_P1 6 0 LPT Lecter Bothic Type\*ace Scandard Sets Character Group Character Set Code Page 437 ASHD 449 Anapic Sets Cyrillic Sets (.yr-1111c 860 Latin 2 3859 2 Furopeen Sets ULC 256 Grack Grane Sets Hebrew Seta HUDE WW 01d 2418 Gen. Turk. Turkish Sets ASCE3 (USA) 320 0PT Multinationel 19C feature roll Ventical OPL 72 CPT Prop. Spanning Jealth Print Enable Of each in Slashed Zero Disable Left Hangin Right Mangin 0 characters 0 characters 0 Intespaces 0 linespaces top Marq1\* Bottom Margan Print Char Set Define CR code Auto LF CR + CR Enable Define LF code U1 = 1 F FPSON FX SEIVE Select CPL 10 0 CPI 6.0 LP: Letter Gechic Select LPE Typeface Character Group Character Set Standard Sets Epson 5+1 A5M0 449 Cyr1''in 866 Amel:14 Sets Cyr1111r Sets Lat .n 2 8259-2 Luropaan Sets DEC 256 Greek Greek Sets Hehrma Sets Turkish beta Data Gen. Lunk. ASGII (USA) ASCII (USA) Epson Set Pulcinational 120 DP: 72 DP: Horizonta) CP1 Vertical CPJ Enable Prop Specine Lialic Print 111 6 at: 1 @ D1sap1e Slashed Zero .eft Mangon 0 characters Right Mangin Top Mangin 0 characters 0 'INNEPACES 0 )Inespaces Botton Margar Print Char, Set Unfine CR code CR = CREnable Auto LF Cafina LF code  $L^{+} = L^{+}$ DIAGNOSTICS Printer Tests Content Config Continuous Tast Count Hex Dump Mode Print Error Lug Clear Frrun Lug D1980'M 6 Megaby 'e' System Memory Ptr Un Time Pir Print Dist Head Pri Dist 144.5 Hours 42381 Locies 3119 Loches Head On Thee 2.2 HOURS Reset Head Data 100 DP1 Mead Type 24.20±0.48 m)Ls Head Voltege PARALLES PORT Purt Type Centronics Cate B.t B Loob'e PT Ignored Frieldie Buffer Siza in K Buffer Size in K в 16 Trickle Fina Timeout 1/4 sec 10 8#0. Report Status Disable SERIAL PORT RS 232 Fort Type Baud Rate 9600 BAUD Word Length а Stop 0114 Parity Data Prolocol Sone XDN / KC1 F Buffer Size in K 7 1/4 sec Trickle Time 10 see. CommercialS Orsabile Report Status

Figure 2. Sample Configuration Printout (sheet 3 of 3)

## Menu Overview



Press  $\stackrel{:}{:=}$  to select the next top level menu. Press  $\downarrow$  or  $\uparrow$  to move within each top level menu.

Notes:

- 1. Shaded boxes denotes the top-level menu location where the selected items appear. Only the selected items will appear in the top-level menu.
- 2. Page numbers in top-level menu selections refer to the location of detailed menu item information.

### Figure 3. Configuration Top-Level Menu Overview

# **Menu Options**



Figure 4. Menu Options



Press := to select the next top level menu.

Press  $\downarrow$  or  $\uparrow$  to move within each top level menu.

Press + or - to cycle through each possible menu item value.

**NOTE:** Bold selections available only when the Advanced User selection (found under PRINTER CONTROL) is enabled.

NOTES:

- 1. Appears only if the CTHI option is installed.
- 2. Presence of these Top Level items depends on the Port Type selection (under PRINTER CONTROL).
- 3. Appears only if CTHI emulation (under PRINTER CONTROL) is set to Standard.
- 4. Appears only if CTHI emulation (under PRINTER CONTROL) is set to Simp Prot Conv.

### Chapter 3 Menu Options



Power-up ^X (page 136)

Standard Sets (page 144) Select LPI (page 141) Define CR Code (page 120) Define LF Code (page 120) Autowrap (page 110) Auto Uppercase (page 109) Slash 0 (page 143) Select SFCC (page 142) Host Form Length (page 128) **Optimized Ratio (page 133)** PI Slew Range (page 135) CR Edit (page 119) Skip Cmd Prefix (page 143) Ignore Text (page 130) Power on IGP (page 135) Ext Execute Copy (page 123) Al 00 Spaces (page 108) Select SO Char (page 142) Ignore Mode (page 130) Select Char (page 141) Do FF at TOF (page 121) IGP 100 Compatbl. (page 130) Autoeject (page 110) IGP Normal (page 134) UPC Descenders (page 147) I-2/5 Selection (page 129) Error Report (page 122) Repeat Form Opt (page 139)

Press  $\downarrow$  or  $\uparrow$  to move within each top level menu.

Press + or - to cycle through each possible menu item value.

Power-up ^F (page 135) Power-up ^PY (page 135) LPI (page 132) Btm Margin Ctl (page 111) Text Length (page 145) Autoeject (page 110) Copy Count (page 118) Host Form Length (page 128) Slash 0 (page 143) Ignore Dots (page 130) Append Rotated (page 109) Truncate Alpha (page 146) True Vert 1/10 (page 146) Absorb After ^PY (page 108) UPC Descenders (page 147) Rot. Char Size (page 140) Ignore Spaces (page 130) Midline PY (page 132) Width Limit (page 149) Absorb After ^PN (page 107) Error Msgs (page 122) Error Markers (page 122) Offpage Errors (page 133) Barcode Errors (page 110) Ignore Chars (page 129) Ignore Ch#1 (page 129) Ignore Ch#2 (page 129) Data Bit 8 (page 119) Cmd Resolution (page 118) ^Dnn Dot Slew (page 107) Var Ratio Barcd (page 148) Character Group (page 114) Standard Sets (page 144) Uniform Fonts (page 147) Prop Line Length (page 138) Printer PI (page 138) Host PI (page 128) Max PI 16 (page 132)

Select CPI (page 141) Select LPI (page 141) Typeface (page 146) Character Group (page 117) Character Set (page 118) Primary Subset (page 138) Extended Subset (page 123) Horizontal DPI (page 127) Vertical DPI (page 148) Prop. Spacing (page 138) Italic Print (page 131) Slashed Zero (page 144) Left Margin (page 132) Right Margin (page 139) Top Margin (page 145) Bottom Margin (page 111) Print Char. Set (page 138) Define CR Code (page 120) Auto LF (page 109) Define LF Code (page 120) Control Code 06 ((page 118) Control Code 08 (page 118) Bold (page 111) Overstrike (page 134) Select SFCC (page 142) EVFU Select (page 123) Alt. Set 80-9F (page 108) SFCC d command (page 143) PSeries Dbl High (page 139) FF valid at TOF (page 123) Text Position (page 145) Host Command (page 127) Reset Cmd CFG Ld (page 139) Form Length (in.) (page 124) Form Length (mm) (page 124) Form Length (lines) (page 124) Form Width (in.) (page 124) Form Width (mm) (page 125) Form Width (char.) (page 124)

**NOTE:** Bold selections available only when the Advanced User selection (found under PRINTER CONTROL) is enabled.

NOTES:

1. Presence of these Top Level items depends on the Active IGP Emul selection (under PRINTER CONTROL).

2. Presence of these Top Level items depends on the ASCII Emulation selection (under PRINTER CONTROL).

#### Figure 4. Menu Options (continued)

P-SER XQ SETUP<sup>(1)</sup>

Select CPI (page 141) Select LPI (page 141) Typeface (page 146) Horizontal DPI (page 127) Vertical DPI (page 148) Prop. Spacing (page 138) Italic Print (page 131) Slashed Zero (page 144) Left Margin (page 132) Right Margin (page 139) Top Margin (page 145) Bottom Margin (page 111) Print Char. Set (page 138) Define CR Code (page 120) Auto LF (page 109) Define LF Code (page 120) Control Code 06 (page 118) **Compressed Print (page 118)** Bold (page 111) Elong/Alt. Font (page 121) Gothic Typeface (page 125) EVFU Select (page 123) Upr. Case Select (page 147) Slew Relative (page 144) Text Position (page 145) Host Command (page 127) Reset Cmd CFG Ld (page 139) Form Length (in.) (page 124) Form Length (mm) (page 124) Form Length (lines) (page 124) Form Width (in.) (page 124) Form Width (mm) (page 125) Form Width (char.) (page 124)

SER MATRIX SETUP<sup>(1)</sup>

Select CPI (page 141) Select LPI (page 141) Typeface (page 146) Character Group (page 117) Character Set (page 118) Primary Subset (page 138) Extended Subset (page 123) Horizontal DPI (page 127) Vertical DPI (page 148) Prop. Spacing (page 138) Italic Print (page 131) Slashed Zero (page 144) Left Margin (page 132) Right Margin (page 139) Top Margin (page 145) Bottom Margin (page 111) Print Char. Set (page 138) Define CR Code (page 120) Auto LF (page 109) Define LF Code (page 120) Control Code 06 (page 118) Bold (page 111) Overstrike (page 134) Printer Select (page 138) Alt. Set 80-9F (page 108) ESC d command (page 122) Text Position (page 145) Host Command (page 127) Reset Cmd CFG Ld (page 139) Form Length (in.) (page 124) Form Length (mm) (page 124) Form Length (lines) (page 124) Form Width (in.) (page 124) Form Width (mm) (page 125) Form Width (char.) (page 124)

Select CPI (page 141) Select LPI (page 141) Typeface (page 146) Character Group (page 116) Character Set (page 118) Horizontal DPI (page 127) Vertical DPI (page 148) Prop. Spacing (page 138) Italic Print (page 131) Slashed Zero (page 144) Left Margin (page 132) Right Margin (page 139) Top Margin (page 145) Bottom Margin (page 111) Print Char. Set (page 138) Define CR Code (page 120) Auto LF (page 109) Define LF Code (page 120) 20 CPI Condensed (page 107) Bold (page 111) FF valid at TOF (page 123) Text Position (page 145) Host Command (page 127) Reset Cmd CFG Ld. (page 139) Form Length (in.) (page 124) Form Length (mm) (page 124) Form Length (lines) (page 124) Form Width (in.) (page 124) Form Width (mm) (page 125) Form Width (char.) (page 124)

Press  $\equiv$  to select the next top level menu.

Press  $\downarrow$  or  $\uparrow$  to move within each top level menu.

Press + or - to cycle through each possible menu item value.

NOTES:

1. Presence of these Top Level items depends on the ASCII Emulation selection (under PRINTER CONTROL).

**NOTE:** Bold selections available only when the Advanced User selection (found under PRINTER CONTROL) is enabled.

### Chapter 3 Menu Options

	EPSON FX SETUP <sup>(2)</sup>		DIAGNOSTICS		PARALLEL PORT		
Select CPI (page 141) Select LPI (page 141) Typeface (page 146) Character Group (page 115) Character Set (page 118) Epson Set (page 121) Horizontal DPI (page 127) Vertical DPI (page 148) Prop. Spacing (page 138) Italic Print (page 131) Slashed Zero (page 144) Left Margin (page 132)		Prir Tes Hex 15) Prir ) Cle Sys 7) Ptr Ptr ) Hea Res Hea	Printer Tests (page 151) Test Count (page 152) Hex Dump Mode (page 150) Print Error Log (page 150) Clear Error Log (page 150) System Memory (page 151) Ptr On Time (page 151) Ptr Print Dist (page 151) Head Prt Dist (page 150) Head On Time (page 150) Reset Head Data (page 151) Head Type (page 150)		PORT prt Type (page 154) ata Bit 8 <sup>4</sup> (page 153) Ignored <sup>4</sup> (page 153) Iffer Size in K (page 1 ickle Time (page 160) meout (page 159) eport Status (page 159) eport Status (page 159) ime Signal (page 159) ata Polarity <sup>4</sup> (page 159) ata Polarity	52) 4) 53) 154) • 152) 153)	
Right Margin (page 139) Top Margin (page 145)		Hea	ad Voltage (page 150)	Ed	ion bata on (page	100)	
Bott Prin Defi Auto Defi	om Margin (page 111 t Char. Set (page 138 ne CR Code (page 13 o LF (page 109) ne LF Code (page 12	20) 20)	SERIAL PORT		C/T PORT <sup>(1)</sup>		
Printer Select (page 138) 20 CPI Condensed (page 107) Bold (page 111) Alt. Set 80-95 (page 108)		3) Je 107)	Port Type (page 15 Baud Rate (page 15 Word Length (page Stop Bits (page 150	4) 55) 160)	Port Type (page 16 Device Address (pa Image Buf Size (pa Timegeut (page 162	i2) age 160) ige 161)	
Tex Hos Res	t Position (page 145 t Command (page 1 et Cmd CFG Ld (page	/) 27) ge 139)	Parity (page 158) Data Protocol (page Buffer Size in K (pa	9) e 155) ge 155)	Report Status (pag	) e 162)	
For For For	m Length (in.) (page m Length (mm) (pag m Length (lines) (pa	124) je 124) ge 124)	Trickle Time (page Timeout (page 159) Report Status (page	160) e 159)	_		
Form Width (in.) (page 124) Form Width (mm) (page 125) Form Width (char.) (page 124)		124) • 125) je 124)	Data Term Ready (page 157) Request to Send (page 159) Poll Character (page 158) Boll Bespense (page 158)				
			Idle Response (pa One Char Enquiry Printer Status (pag	ge 157) (page 15 ge 159)	8)		

 $\label{eq:Press} \mathsf{Press} \; := \; \mathsf{to} \; \mathsf{select} \; \mathsf{the} \; \mathsf{next} \; \mathsf{top} \; \mathsf{level} \; \mathsf{menu}.$ 

Press  $\downarrow$  or  $\uparrow$  to move within each top level menu.

Press + or - to cycle through each possible menu item value.

**NOTE:** Bold selections available only when the Advanced User selection (found under PRINTER CONTROL) is enabled.

#### NOTES:

- 1. Appears only if the CTHI option is installed.
- 2. Presence of these Top Level items depends on the ASCII Emulation selection (under PRINTER CONTROL).
- 3. Appears only if the Ethernet Interface option is installed.
- 4. Does not appear in menu after an ONLINE/OFFLINE sequence of the IEEE 1284 port type is selected.

### Figure 4. Menu Options (continued)

ETHERNET PARAMS <sup>(3)</sup>		IP ADDRESS <sup>(2)</sup> (page 161)	GATEWAY ADDRESS (page 161)	SUBNET MASK (page 162)
MAC Address (page 161) Novell Protocol (page 161) NetBIOS Protocol (page 161) Novell Frame (page 161) PMU Port Number (page 162) PMU Port Timeout (page 162)		IP Addr Seg 1 IP Addr Seg 2 IP Addr Seg 3 IP Addr Seg 4	GW Addr Seg 1 GW Addr Seg 2 GW Addr Seg 3 GW Addr Seg 4	Subnet Mask Seg 1 Subnet Mask Seg 2 Subnet Mask Seg 3 Subnet Mask Seg 4

 $\label{eq:Press} \text{Press} \ := \ \text{to select the next top level menu.}$ 

Press  $\downarrow$  or  $\uparrow$  to move within each top level menu.

Press + or - to cycle through each possible menu item value.

**NOTE:** Bold selections available only when the Advanced User selection (found under PRINTER CONTROL) is enabled.

NOTES:

- 1. Appears only if the CTHI option is installed.
- 2. Presence of these Top Level items depends on the ASCII Emulation selection (under PRINTER CONTROL).
- 3. Appears only if the Ethernet Interface option is installed.

### Figure 4. Menu Options (continued)

# **Printer Configuration Menu Items**

The following sections provide detailed information on the function of each printer configuration item listed in Figure 4. Each section contains several of the top-level menu items shown in Figure 4, grouped according to basic function. The introduction to each section provides an overall view of each top-level menu item with that section, after which detailed explanations are given for each menu item within that section. Please note that since this manual covers more than one model of printer, in some cases the full range of values listed for a menu item may not be available on a specific printer. Menu items are listed in alphabetical order within each section.

# **Control Functions**

### Introduction

The Control Functions section is comprised of the Config. Control, Media Control, and Printer Control top-level menu items.

- Config. Control. (from page 76) The Config. Control menu items are used to control the printer's configurations according to the specifications required for a specific print job.
- **Media Control.** (from page 76) The Media Control menu items are used to set various parameters relating to print quality, media and ribbon handling, printing method and label layout.
- **Printer Control.** (from page 76) The Printer Control menu items are used to select the desired emulations and various printer operating parameters.

### **Control Menu Items**

(From The following list describes all menu items in the Control Functions toplevel menus.

### Active IGP Emul

(From page 76.) This function allows the user to activate either the IGP or Code V emulation. There are two methods for selecting the desired emulation. The first is by selecting the emulation directly from the printer menu. The second is by sending a host command which will switch the emulation automatically (see the appropriate *Programmer's Reference Manual* for details).

When changing from one IGP emulation to the other, the printer will load the saved configuration. Thus, any setting performed before selecting those interfaces and not saved in NVRAM will be lost.

**IMPORTANT** When the ACTIVE IGP EMUL is switched from one IGP emulation to another, the printer will load the settings saved under the Power-Up Config. menu. These settings may not be the current settings in use prior to switching the Active IGP emulation. The Print Mode, Media Sensor, Media Handling, Calibration, Label Length and Width and numerous other settings in use will change to the settings saved under the Power-Up Config. menu. Users should therefore insure that all desired settings are saved as the printer Power-Up Config. menu settings prior to switching the Active IGP emulation.

The factory default is IGP.

### **Advanced User**

(From page 76.) When enabled, this function permits access to menu items which would not normally be changed by a typical user.

The factory default is Disable.

### Alarm

(From page 76.)

- **On.** An audible alarm sounds (3 beeps) when a fault occurs, such as a paper jam.
- **Cont. Beep.** A continuous audible alarm sounds when a fault occurs, which can be stopped by pressing CLEAR.
- Off. No audible alarm will sound.

The factory default is On.

### Auto Label Width

(From page 76.) The width of a single label to be printed or the maximum width of the media that will be used for the print file. The value is selectable from 00.1 inch through the maximum print width of the printer.

**NOTE:** The maximum Auto Label Width value will be limited to the current MEDIA CONTROL/Label Width value selected in the configuration menu.

The factory default is the maximum printing width.

### **Auto Locking**

(From page 76.)

- Disable. The , key must be locked manually.
- Enable. The printer automatically locks the 
  → key five minutes after the last front key press.

The factory default is Disable.

#### Auto Map Select

(From page 76.) This option specifies the maximum print width to be used by the application. The IGP/Auto Label Mapping\*\* feature allows backward compatibility of programs written for 6400 line-matrix printers using IBM IGP graphics languages. It allows the printer to print two-up (or other multi-up) labels. Instead of printing multiple labels across the printer, it prints the leftmost label and the rightmost label, so the printout will be twice as long but half as wide.

When enabled, the printer will automatically reposition the horizontally adjacent labels to a vertical adjacent position, or combination of horizontal and vertical position based on the values selected under the Auto Label Width and Num Auto Labels menu items.

When disabled, excess data in any program sent to the printer with horizontally adjacent labels that exceed the physical page width of the printer will be clipped or wrapped depending upon the setting of the Autowrap menu option.

The factory default is Disable.

#### Examples

All of the examples below assume that the logical form length is set to the label length.

#### Example 1: Simple Case

**Problem:** A file has been constructed with two horizontally adjacent 4" labels for a printer with a physical width of 8". The user now desires to use this file with a printer that has a 4" physical width.

**Solution:** The user sets Auto Label Width to 4" (the width of the label), configures the Num Auto Labels to 2, and enables the Auto Label Mapping feature.

**Printer Operation:** The printer will print the first (leftmost) 4" label first. Once the first label has been completed, the printer will print the second 4" label. These labels will appear vertically adjacent on the form.



#### **Example 2: Uneven Number Case**

**Problem:** A file has been constructed with three horizontally adjacent 2" labels. The user now desires to use this file with a printer that has a 4" physical width.

**Solution #1:** The user sets *Auto Label Width* to 4" (the width of two labels), configures the *Num Auto Labels* to 2, and enables the Auto Label Mapping feature.

**Printer Operation for Solution #1:** The printer will print the first two labels at the same time. These first two labels will be horizontally adjacent. Once these labels have been completed, the printer will print the remaining 2" labels along with a blank 2" label.

File Contents:

Print Output:



**Solution #2:** The user sets *Auto Label Width* to 2", configures the *Num Auto Labels* to 3, and enables the Auto Label Mapping feature.

**Printer Operation for Solution #2:** The printer will print the first 2" label by itself, the second 2" label by itself, and finally, the last 2" label by itself.



#### **Example 3: Past Maximum File Width**

**Problem:** A file has been constructed with three horizontally adjacent 4" labels. The user now desires to use this file with a printer that has a 8" physical width. The user should have used a solution similar to one of the solutions in the section above, but the user erroneously enters an *Auto Label Width* of 12" and a *Num Auto Labels* of 3.

**Printer Operation:** Maximum *Num Auto Labels* = (20"/12") = 1.67 rounded up to 2. The printer will automatically reduce the *Num Auto Labels* to 2.

#### Example 4: Blank Label Case

**Problem:** A file exists with two horizontally adjacent 4" labels. The user now desires to use this file with a printer that has a 4" physical width. The user decides to set the *Num Labels* to 3 and the *Label Width* to 4" despite the fact that these values are not optimum.

**Printer Operation:** The maximum *Num Auto Labels* =  $(20^{"}/4") = 5$ . The selected value of 3 is legal. After the file is sent, the printer will begin by printing the first 4" width label. Once that label is complete, it will print the second 4" width label. Finally, once both of those labels have been printed, the printer will print a blank 4" label.



### **Bold Chars.**

(From page 76.) This menu entry permits the user to adjust the thickness or font weight of bold text fonts. The factory default is 448. This menu will not take effect unless it is saved in a configuration and the printer is powered up with that configuration.

### **Cancel Key**

(From page 76.) When enabled, the  $\mathbf{x}$  key may be used to clear all data in the print buffer without printing any of the data.

The factory default is Disable.

### **Clip Page**

(From page 76.) This option determines how the printer handles images that are too large for one physical page length.

- **Disabled.** When the user selected page length is greater than the physical page length, the printer continues to print the remaining excess data onto the next physical page.
- **NOTE:** This should be used only when attempting to ignore labels with a predetermined length.
- **Enable.** When the user selected page length is greater than the physical page length, the printer clips the excess data to fit the physical page. The excess data is lost. The predetermined label length established by the gap, notch hole, or black stripe is used to establish TOF position.

The factory default is Enable.

### Compatibility

(From page 76.) This parameter allows you to make 4400 Series thermal printers compatible with other printers.

When trying to preserve compatibility with respect to barcodes, you may not always be able to make them equal in size. This is due to the various Dot-Per-Inch differences between printer types. In the case where an exact match cannot be made, the barcode is reduced in size so that the form bounds will not be compromised and the barcode will be readable.

- Default. The default. Use for optimum performance.
- Laser. Forces the output to correspond with the laser line of printers.
- P5000. Forces the output to correspond with the P5000 line of line matrix printers.
- T3000. Forces the output to correspond with the T3000 line of thermal printers.
- T1006. Forces the output to correspond with the T1006 line of thermal printers.

The factory default is Default.

### **CTHI Emulation**

(From page 76.) This menu item selects the operation of the CTHI option as either a standard or simple protocol converter, and appears only when the CTHI option is installed.

The factory default is Standard.

#### Standard CT Interface

With a standard coax interface, the printer emulates the following IBM coax printer models:

- 3287 Models 1 and 2
- 4234 Models 1

WIth a standard twinax interface, the printer emulates the following IBM twinax printer models:

- 4234 Models 2 and 12
- 5225 Models 1,2,3 and 4

The standard Coax/Twinax emulation selection will only be available if Coax or Twinax is selected from the HOST INTERFACE menu.

**NOTE:** For more information, consult the *Coax/Twinax Programmer's Reference Manual.* 

#### Simple Protocol Converter

The Simple Protocol Converter (SPC) option allows those who use add-oncoax or twinax protocol converters to produce the same output on a IBM thermal printer with the Coax/Twinax (CTHI) capability as done using a non-CT printer with the third party converter interfaces.

The SPC gives the printer the operational ability to connect to any PC, or network system supporting parallel or serial interfaces, and to three different IBM host systems.

- System 3x
- AS/400\*

• 327x Control Units

The SPC will support the same models for Twinax as the IBM 6400 printer.

The printer emulations supported by the SPC are Twinax 5225 and Coax 3287. The SPC also provides a range of interfaces available in your thermal printer: Centronics, serial, coax, and twinax. Also supported are Epson, Proprinter, P-Series, Serial Matrix, Code V, and IGP emulations.

The SPC has the ability to handle multiple print jobs concurrently through coax/twinax and parallel and serial interfaces. This is accomplished through the Auto Switching feature (see "Auto Switching" on page 165). Because of hardware restrictions, coax and twinax cannot be selected together.

For more information, consult the Coax/Twinax *Programmer's Reference Manual* for the Simple Protocol Converter Option.

### Delete Config.

(From page 76.) You can delete one or all of your eight customized configurations. The factory default configuration cannot be deleted.

The factory default is 1.

### **Display Language**

(From page 76.) This parameter chooses the language that will appear on the LCD: English, Spanish, French, Italian, or German.

The factory default is English.

### **Display Ribbon**

(From page 76.) When enabled, the remaining length of unused ribbon will be displayed on the LCD when in the online mode.

The factory default is Enable.

### **Error Recover**

(From page 76.) This option determines how the printer handles data that was printing when an error occurred.

- **Disabled.** The printer will not reprint the label that was printing when the error condition occurred.
- Enable. The printer reprints the label that was printing when the error condition occurred.

The factory default is Disable.

### Extra Bold Char.

(From page 76.) This menu entry permits the user to adjust the thickness or font weight of extra bold text fonts. The factory default is 504.

**NOTE:** For most applications, the default settings for font memory are acceptable. Therefore, do not change the defaults unless your application requires an uncommon memory configuration.

### **Gap Sense**

(From page 76.) This option specifies the method need to detect the media Top-of-Form condition.

**None** - indicates that continuous media with no black strip and no transmissive gap is being used. Forms length is based on the Label Length value in the Media in the Control Menu.

**Reflective** - Indicates media with a horizontal black stripe on the back side of the liner is being used. The leading edge of the black stripe establishes the top-of-form position.

**Transmissive** - Indicates media with a space or "gap" between die cut labels is being used, where the media backing or liner is present between labels. Transmissive sensing is also used to detect pre-punched notches or holes in butt-cut or tag stock media. The trailing edge of the "gap" or notch establishes the top-of-form position.

The factory default is None.

#### Gap Thresh

(From page 76.) This menu item sets a value that, when exceeded by the output of the Top-of-Form sensor, is recognized by the printer as the interlabel gap (Top-of-Form). When the automatic Paper Calibrate procedure is performed, the value displayed is equal to the gap threshold value set by this procedure. If running the procedure does not provide a reliable Top-Of-Form detection, e.g., when using unusual media, the Gap Thresh value can be manually set to the desired value.

#### **Glob Mem Adjust**

(From page 76.) This menu item permits the user to adjust the ratio of global memory allocated to label size vs. IGP forms, fonts and logos. For example, if short labels are used, the user can allocate more memory to forms, fonts, and logos by increasing the Glob Mem Adjust value. The default settings and adjustment ranges depend upon the amount of installed printer memory, and are listed below.

	4 MB	8 MB	16 MB
Factory Default	0 MB	0 MB	3 MB
Range	0 to 1 MB	0 to 1 MB	0 to 9 ME

#### Hor Image Shift

(From page 76.) This option specifies the amount to shift an image horizontally left (-) or right (+) for precise positioning on the label. The actual width of the image is not affected by this parameter. The allowable range is - 1.00 through +1.00 inches in .01 inch increments, displayed as xx/100. The factory default value in inches is 0.00.

### Label Length

(From page 76.) This option specifies the user-selected Label Length in inches or millimeters. In most applications this user-selected Label Length will match the *Physical* label length. Physical label length is the actual label length of the media installed.

Physical label length for transmissive media represents the leading edge to trailing edge distance of the die-cut label. It does not include the distance of the transmissive gap.

Physical label length for reflective media is the distance from the trailing edge of one black stripe to the trailing edge of the next black stripe.

**NOTE:** When using reflective media it is recommended that the userselected Label Length be set approximately 0.10 inches less than the physical label length distance or intermittent shifting of TOF (Top-of-Form) position or label skip may result.

When continuous media with no transmissive gap, or black stripe is installed (no predetermined length) and the MEDIA CONTROL/Gap Sense menu item = None, the user-selected Label Length under the MEDIA CONTROL menu will determine the length of the physical label.

When transmissive or reflective media is installed (media with a predetermined physical label length established by a transmissive gap, notch, hole or black stripe) the user should set the Label Length value to match the predetermined physical length of the media.

When the user-selected Label Length value is shorter than the physical label length of the transmissive or reflective media, the printer will leave a blank space the remaining distance of the physical label and advance the media to the next TOF position. When user-selected Label Length is longer than the physical label length, the printer will print the remaining part of the label on the next label and then advance to the next TOF position. However, if the Clip Page menu option = Enable, the printer will clip the label to fit the physical label and the data not printed will be lost. See Appendix C for details regarding user-selected label length vs. physical label length.

The MEDIA CONTROL menu Label Length value will override and change the ASCII Emulation menu Absolute Form Length value.

If the ASCII Emulation, IGP or Code V Host Form Length = Enable in the configuration menu, then Host Form Length software commands will override and change the MEDIA CONTROL Label Length value. The sent Host Form Length value can be viewed under the Label Length option in the MEDIA CONTROL configuration menu.

If the ASCII Emulation, IGP or Code V Host Form Length = Disable, then Host Form Length software commands will have no effect on the MEDIA CONTROL menu Label Length value.

The allowable Label Length range is 00.1 to 99.0 inches (2.5 - 2514.6mm) The factory defaults are listed below:

Printer	Inches	mm	Lines
4400-004	6"	152.4	36
4400-006	4"	101.6	24
4400-008	6"	152.4	36

Table III actory Delaant Laber Length	Table 2.	Factory	Default	Label	Length
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Label Length range is limited to a maximum value of 47.0 inches (1193.8mm) when Label Width is set to 4.1 inches. Decreasing (narrowing) the Label Width will extend the range limits of the Label Length and permit a longer Label Length selection (99.0 inches maximum).

### Label Width

(From page 76.) This option specifies the physical width of the image to be printed. The value can be specified in inches or millimeters depending on the setting of the Units option under the MEDIA CONTROL menu. The allowable range in inches is 00.1 to the maximum print width of the printer. The allowable range in millimeters is 2.5 to the maximum width of the printer.

The factory default value is the maximum printing width.

### Load Config.

(From page 76.) The printer can store up to eight configurations in memory. This parameter allows you to select and load a specific configuration. The factory default is Factory.

### **ASCII Emulation**

(From page 76.) This menu item selects the line or dot matrix printer to be emulated by the 4400 printer.

The factory default is 6400 Series.

### Max Cache Memory

(From page 76.) The Maximum Cache Memory option specifies the size of the memory block that can be allocated to the font cache. The font cache stores bitmaps that are created on demand from the font outlines stored on the printer flash. The cache allows the printer to print scalable fonts at optimum speed.

To calculate the memory requirement, use this equation:

horizontal resolution X	vertical resolution X	average character height (inches) X	average character width (inches) X	# of characters to be cached
		8		

The allowable range is 50 KBytes through 900 KBytes in 50-KByte increments.

The factory default is 900 KB.

**NOTE:** For most applications, the default settings for font memory are acceptable. Therefore, do not change the defaults unless your application requires an uncommon memory configuration.

### Max Cached Char

(From page 76.) The Maximum Cached Characters option specifies the size of the largest character that can be stored in the font cache. To calculate the memory requirement, use this equation:



For example, with a print head that prints at 203 dpi you would use the following formula:

$$\frac{203 \times 203 \times 1 \times 1}{8} = 5,151$$

Therefore, select a value that is equal to or greater than 5,151. The closest available value is 6 KBytes.

The allowable range is 1 KByte through 20 KBytes, in 1-KByte increments.

The factory default is 1 KB.

**NOTE:** For most applications, the default settings for font memory are acceptable. Therefore, do not change the defaults unless your application requires an uncommon memory configuration.

### Media Handling

(From page 76.) This option specifies how the printer will handle the media (paper or tag stock).

- **Continuous.** Printer prints on the media and sends it out the front.
- **Tear-Off Strip.** Printer prints on the media and sends it out the front until the print buffer is empty, then positions the last label over the tear-off bar for removal.
- **Tear-Off.** After each label is printed, the printer positions the label over the tear-off bar and waits for you to tear-off the label before printing the next one (on-demand printing). A LABEL PRESENT/Remove Label message will display to remind you to remove the label before the next one can be printed.
- **Peel-Off.** Prints and peels die-cut labels from the liner without assistance. The printer waits for you to take away the label before printing the next one (on-demand printing). The label backing is rewound on the internal rewinder. A LABEL PRESENT/Remove Label message will display to remind you to remove the label before the next one can be printed.

The factory default is Continuous.

### Name Config (1-6)

(From page 76.)You may specify a 15 character name which can be used to refer to a configuration. The name you enter for a configuration will be used in the Load Config., Save Config., Print Config., Delete Config., and Power-Up Config. menus. The names can only be cleared by using the Reset Cfg Names menu.

When you move into the Name Configs. menu, the top line of the display shows the current configuration name. The second line of the display is initially the same as the top line. You can modify the second line of the display without affecting the top line until the  $\rightarrow$  key is pressed, which sets the modified name as the current selection.

Press the  $\uparrow$  or  $\downarrow$  keys to cycle through the values available for that character at the cursor location. Press the + key to move to the next character to be modified. Press the - key to go back to a character you have already modified. Continue until you have entered the name you want to give to this configuration, then press  $\downarrow$  to save. The name you entered will now represent this configuration on the printer's front panel. To exit this menu without saving, press any key other than the  $\downarrow$  key. The configuration name will revert to the last saved value.

The factory default is 1.

### Num Auto Labels

(From page 76.) The desired number of labels to be printed vertically adjacent on the form. The value is selectable with a range of 1 through 40 (4400-004), 1 through 21 (4400-006) and 1-17 (4400-008).

The factory default is 2.

### **Optimize&Reboot**

(From page 76.) Reclaims flash space from deleted flash files. After pressing  $\downarrow$  wait for the printer to reboot.

### Orientation

(From page 76.) This menu item selects the image orientation to be used when printing the label.

• **Portrait**. Portrait refers to vertical page orientation, where the height of a page is greater than its width. The top edge of the image is parallel to the leading edge of the media. The following illustration is an example, with the operator viewing the front of the printer.



• **Inv. Portrait**. Inverse Portrait refers to vertical page orientation, where the height of a page is greater than its width. The top edge of the image is parallel to the trailing edge of the media. The following illustration is an example, with the operator viewing the front of the printer.



• Landscape. Landscape refers to horizontal orientation, where the width of a page is greater than its height. The top edge of the image is the left edge of the media. The following illustration is an example, with the operator viewing the front of the printer.



• **Inv. Landscape**. Inverse Landscape refers to horizontal orientation, where the width of a page is greater than its height. The top edge of the image is the right edge of the media (the left edge of the image is the trailing edge of the media). The following illustration is an example, with the operator viewing the front of the printer.



The factory default is Portrait.

### **Overwrite Files**

(From page 76.) This allows you to prevent files from being overwritten by disabling the overwrite function.

The factory default is Enable.

### Pap Out Th

(From page 76.) This menu item selects a value that, when exceeded by the output of the Top-of-Form sensor, is recognized by the printer as a paper out condition. When the automatic Paper Calibrate/Run Calibrate procedure is performed, the value displayed is equal to the paper out threshold value set by this procedure. If running the procedure does not provide a reliable paper out detection, e.g., when using non-standard media, the Pap Out Th value can be manually set to the desired value.

### **Paper Calibrate**

(From page 76.) This feature is used to optimize the sensitivity of the Top-of-Form sensor in detecting the TOF (Top-of-Form) position of the current media installed. The sensitivity is adjusted manually by changing the Gap Thresh or Pap Out Th menu settings or is determined automatically by using the Paper Calibrate/Run Calibrate procedure.

The change in values (derived automatically or manually entered) take effect immediately within the current configuration menu. They can be saved into non-volatile memory (menu's 1-8 only) by using the Save Configuration procedure. We highly recommend that you take advantage of the values automatically determined by the Paper Calibrate/Run Calibrate procedure before attempting to make any manual changes to the Gap Thresh or Pap Out Th values. If the Paper Calibrate/Run Calibrate procedure fails to determine the proper values and ends with a fault message displayed (GAP NOT DETECTED or PAPER OUT), you can manually enter the Gap Thresh or Pap Out Th values and press the FEED key to determine if the gap or black stripe can be consistently detected.

Pressing the ⊣ key with Paper Calibrate/Run Calibrate displayed initializes the automatic calibration procedure. This advances the media a minimum of 11 inches plus the distance required to detect 3 additional TOF positions. The procedure is successfully completed if no fault message is displayed and the Sensed Distance value is correct. The result is that the Gap Thresh, Pap Out Th (depending on which media type is installed) and the Sensed Distance values will be determined automatically. The Calibrate procedure can also be performed under the TEST PRINT menu, Printer Tests/Calibrate.

### **Paper Feed Shift**

(From page 76.) This option represents the distance to advance a label when the Tear-Off Strip, Tear-Off, Peel-Off, or Cut media handling option is enabled.

The default value is 0.00 inches.

### **Power Saver Time**

(From page 76.) The time interval you specify for this parameter sets the amount of idle time before the printer goes into Power Saver mode. When instant is chosen, the printer goes into Power Saver mode as soon as printing stops.

Pressing any key removes the power saver message from the control panel. Sending a print job to the printer also turns off power saver mode.

The factory default is 15 minutes.

#### Power-Up Config.

(From page 76.) You can specify which of the nine configurations (Factory or 1-8) will be the power-up configuration.

The factory default is Factory.

### **Power-up State**

(From page 76.)

- Online. The printer powers up in the online state.
- **Offline.** The printer powers up in the offline state. This selection must be saved as a power-up configuration to be used.

The factory default is Online.

### Print Config.

(From page 76.) This option is used to print a listing of various stored printer configurations. It is recommended you store printouts of your configurations in a safe place for quick referral.

The factory default is Current.

#### Print File List

(From page 76.) Prints a summary of the files stored in flash memory and several statistics on File System usage.

### **Print Intensity**

(From page 76.) This option specifies the level of thermal energy from the printhead to be used for the type of media and ribbon installed.

Large numbers imply more heat (thermal energy) to be applied for each dot. This has a significant effect on print quality. The print intensity and speed must match the media and ribbon type to obtain the best possible print quality and barcode grades.

The factory default is -3.

### **Print Mode**

(From page 76.) This option specifies the type of printing to be done.

Direct - indicates the Direct Thermal type of printing (no ribbon) and requires special heat sensitive media.

Transfer - indicates the Thermal Transfer type of printing (ribbon installed).

The factory default is Transfer.

### **Print Speed**

(From page 76.) This option specifies the speed at which the media passes through the printer.

The factory default print speed is the maximum printing speed of the printer.

### **Protect Configs.**

(From page 76.) You can specify whether or not a new configuration should overwrite an existing configuration when you activate the Save Configs. parameter. When disabled (default), the new configuration will overwrite the existing configuration. When enabled, the new configuration will *not* overwrite the existing configuration, and the message "CONFIG. EXISTS / Delete First" displays.

The factory default is Disable.

### **Ptr Setup Parse**

(From page 76.) Disables or enables the PTR SETUP command.

The factory default is Enable.

### **Ptr Setup SFCC**

(From page 76.) Allows you to choose the hex value of the ASCII character you wish to use as the SFCC for the PTR SETUP command. Valid hex values are 01-FF.

The factory default value is hex 21, which corresponds to the "!" character.

### **Reset Cfg Names**

(From page 76.) You can reset specific configuration names back to the default value of the configuration number.

The factory default is 1.

### **Ribbon Low**

(From page 76.) This menu item defines the Ribbon Low condition for the ribbon supply spindle. When set to a specific value from the available ranges (100, 75, 50, 25m), a ribbon low message will be displayed along with a flashing ONLINE status indicator when the length of ribbon remaining on the ribbon supply spindle has reached that value. The indicator will continue to flash until the ribbon supply is exhausted. When Disabled, no ribbon low condition will be indicated. A Ribbon Low condition will not prevent printing.

The factory default is 50 meters.

#### **Ribbon Select**

(From page 76.)This menu item selects the type of ribbon which will be used for a print job. When a particular ribbon is selected, the printer automatically adjusts the print intensity for optimum results with that ribbon. If Other is selected, the user must manually adjust the Print Intensity and Print Speed values for optimal printing results.

The factory default is IBM 4400 TTW.

#### **Ribbon Width**

(From page 76.) When Same As Paper is selected, the printer automatically adjusts the ribbon operating parameters to match the installed media width. In those cases where the media width is less than the installed ribbon width, the Set In Menu option should be selected. After selection, the ribbon width is set to the proper value by pressing the  $\downarrow$  key and choosing the actual ribbon width using the + and - keys. The chosen width is then selected by pressing the  $\downarrow$  key.

The factory default is Same As Paper.

#### Save Config.

(From page 76.) This option allows you to save up to eight unique configurations to meet different print job requirements. This eliminates the need to change the parameter settings for each new job. The configurations are stored in memory, and will not be lost if you turn off the printer. If the Protect Configs. parameter is enabled, the new configuration will not be saved unless the existing configuration has been deleted first. The factory default configuration cannot be changed. See "Saving a Configuration" on page 68 for details.

The factory default is 1.

### **Sensed Distance**

(From page 76.) This value (in inches) represents the distance that was sensed between the TOF of one label to the TOF of the next label. With Transmissive media installed the distance equals the physical label length + one transmissive gap, notch or hole (trailing edge of one gap, notch or hole to the leading edge of the next gap, notch or hole). With Reflective media installed the distance equals the leading edge of one black stripe to the leading edge of the next. This value is automatically determined only after successful completion of the Run Calibrate procedure and cannot be changed manually.

The factory default is 0.00 inches.

### Set Lock Key

(From page 76.) Normally, to lock or unlock the printer menu, the  $\downarrow$  and  $\downarrow$  keys are pressed at the same time. The Set Lock Key parameter lets you choose different keys to lock or unlock the printer menu. You may choose almost any group of keys as the new lock and unlock keys. You cannot use the  $\downarrow$  key or any key combinations which are already used for another function. There is no limit to how many keys can be selected.

To set the new lock key:

- 1. Go to the PRINTER CONTROL main menu and select "Set Lock Key".
- 2. Press J. The display reads, "Select a new lock key."
- 3. Press the combination of keys that you want to be the new lock key. Make sure you press all keys selected at the same time.
- 4. If the selection is valid, the display will read. "Enter the new lock key again." Press the same combination of keys a second time. If the selection is invalid, the display will read, "Invalid key selection." Return to step 2 and start over.
- 5. If the new lock key combination is entered again correctly, the display will read, "Lock key has been changed." If it was entered incorrectly, the display will read "Validation failed." Start over at step 1.
- 6. After entering the new lock combination successfully, press the PAUSE key to put the printer back online.
- **NOTE:** The new lock combination will remain even if the printer is powered off and back on.

### **Slew Speed**

(From page 76.) This menu item selects the speed at which media will be advanced after the printer determines there is no more data to be printed on a label.

The factory default depends on printer width and head density.

### Standard Chars.

(From page 76.) This menu entry permits the user to adjust the thickness or font weight of standard text fonts.

The factory default is 340.

#### **Tear-Strip Time**

(From page 76.) When using Tear-Strip Time media handling, this option specifies the number of seconds after the buffer is empty that the printer will wait before it advances media to the tear-off position.

The factory default is 1 second.

### Units

(From page 76.) This menu item selects either millimeters or inches as the unit of measure.

The factory default is inches.

#### Ver Image Shift

(From page 76.) This option specifies the amount to shift an image vertically up (-) or down (+) for precise positioning on the label. The actual height of the image is not affected by this parameter. The allowable range is -1.00 through +6.00 inches in .01 inch increments, displayed as xx/100.

The factory default value in inches is 0.00.

### **View File List**

(From page 76.) Displays the list of files in the file system. Pressing the  $\downarrow$  key displays the file size.

### **Emulation Setup Functions**

### Introduction

The Emulation Setup Functions section is comprised of the Standard Coax, Standard Twinax, Simple Protocol Converter (SPC) Coax, SPC Twinax, IGP, Code V, P-Series, P-Ser XQ, Ser Matrix, Proprinter and Epson FX top-level menu items.

You can select emulation default parameters directly from the control panel, or by control codes as explained in the appropriate *Programmer's Reference Manual.* 

# **IMPORTANT** BEFORE you reconfigure an emulation, print a configuration sheet to see all current settings.

### **Standard C/T Interface**

(From page 77.) With a standard coax interface, the printer emulates the following IBM coax printer models:

- 3287 Models 1 and 2
- 4234 Models 1

With a standard twinax interface, the printer emulates the following IBM twinax printer models:

- 4234 Model 2
- 5225 Models 1, 2, 3, and 4

**NOTE:** The standard Coax/Twinax emulation selection will only be available if Coax or Twinax is selected from the C/T PORT Main Menu.

For more information, consult the *Coax/Twinax Programmer's Reference Manual*.

### **Simple Protocol Converter**

(From page 77.) The Simple Protocol Converter (SPC) option allows those who use third party add-on coax or twinax protocol converters to produce the same output on a IBM thermal printer with the Coax/Twinax (CTHI) capability as done using a non-CT printer with the third party converter interfaces.

The SPC gives the printer the operational ability to connect to any PC, or network system supporting parallel or serial interfaces, and to three different IBM host systems:

- System 3x
- AS/400
- 327X Control Units

The SPC will support the following third party models for Twinax: MODE 219, MODE IBM, and MODE P5000.

The printer emulations supported by the SPC are Twinax 5225 and Coax 3287. The SPC also provides a range of interfaces available in your thermal printer: Centronics, serial, coax, and twinax. Also supported are Epson, Proprinter, P-Series, Serial Matrix, Code V, and IGP emulations.

The SPC has the ability to handle multiple print jobs concurrently through coax/twinax and parallel and serial interfaces. This is accomplished through the Auto Switching feature. Because of hardware restrictions, coax and twinax cannot be selected together.

For more information, consult the *Coax/Twinax Programmer's Reference Manual* for the Simple Protocol Converter Option.

#### IGP

(From page 78.) The IGP emulation is the software based Intelligent Graphics Printing (IGP) for the IBM thermal printer family. It is based upon, and compatible with, the IGP-100/200/400 board. It includes the following features:

**On-Line Form and Label Generation** makes it easy to create forms or labels with a "preprinted" look for each application. IGP programs control all graphic functions, dramatically reducing host computer programming and processing time.

Graphic capabilities include boxes, vertical and horizontal lines with userselectable thickness, logos, and special alphanumeric print features. Forms and graphic designs can be duplicated horizontally and vertically.

Alphanumeric data can appear as prepositioned "fixed" information (entered when the form is created), be overlayed onto the form (positioned in a specific location after the form is created), or may be dynamically merged with the form.

**Selectable Bar Codes** provide you with the appropriate bar code for your application using standard wide-to-narrow ratios. A wide selection of bar codes are available: Code 39, Interleaved 2 of 5, UPC-A, UPC-E, MSI A through D, Code 128 Subset A, B, and C, EAN/UCC-128, EAN 8, EAN 13, POSTNET, PostBar, Royal Mail, and PDF417. UPC and EAN bar codes can specify add-on data.

**Expanded and Compressed Character Print** attract attention where needed. Alphanumeric height and width are controlled independently for a wide range of character sizes up to 113 times the standard character size (up to 11.3 inches wide and tall). Compressed print sizes of 12, 13, 15, and 17 characters per inch (cpi) are available.

**Logos** are created using alphanumeric commands and add many print and shading features for a "customized" appearance to forms, reports, and labels.

**Rotated Alphanumerics** permit new concepts in form design. Normal, expanded, and compressed character strings can be rotated 90 degrees clockwise or counterclockwise, or they can be printed upside down.

**Reversed Print** permits highlighting and contrasting by printing white characters on a dark background.

Automatic Increment/Decrement Capability allows batch form processing. You can identify individual numeric and bar code data fields, which includes automatic increment or decrement functions.

**Scaling Capability** permits graphic elements, such as corners or boxes, to retain their physical shapes and sizes when printed in a horizontal and vertical density other than the base density of 60 x 72 dpi.

**Multinational Character Sets** provide 32 international character sets, each 96 characters in length. This feature also allows you to create your own character sets using characters defined and stored in memory.

**Extended Character Sets** provide 33 extended character sets, also containing 96 characters in length. These are also stored in memory.

#### Code V

(From page 78.) The Code V Graphics language is an IGP software emulation designed for the thermal printer. The Code V emulation of the QMS Code V Version II programming language produces on-line forms, bar codes and alphanumeric text generation. It includes the following features.

**On-Line Form and Label Generation** makes it easy to create forms or labels with the "preprinted" look for each application. Code V programs control all graphics functions, dramatically reducing host computer programming and processing time. Graphics capabilities include boxes, vertical and horizontal, solid and dashed lines with a variety of thickness, logos, and special alphanumeric print features.

Variable Bar Codes allow the bar code for your application to print with standard or user-defined ratios in vertical or horizontal orientations. Available bar codes are: Codabar, Code 39, Code 93, Code 128 with Subsets A, B, and C, and Code EAN/UCC 128, EAN 8, EAN 13, Interleaved 2 of 5, MSI, UPC-A, UPC-E, POSTNET, PostBar, Royal Mail, and UPC Shipping. POSTNET is available only in the horizontal direction. A dark print mode is included for darker, high-contrast bar codes. The IBARC bar code command prints bar codes in four orientations: horizontal, rotated 90, rotated 180 or rotated 270 degrees.

**Expanded and Compressed Print** draws attention where needed. Alphanumeric height and width are controlled independently for a tremendous range of character sizes up to 9.9 inches wide and tall. Several compressed print sizes are available: 12, 13.33, 15, 17.65, and 20 cpi (characters per inch), permitting up to 170 columns in an 8.5 inch printed area (20 cpi).

**Rotated Alphanumerics** permit new concepts in form design. Normal, expanded, and compressed character strings can be rotated 90 degrees clockwise, counterclockwise, or printed upside down.

**Logos** are easily created using alphanumeric commands and a variety of print and shading features, providing a "customized" appearance for forms, reports, and labels. The registered trademark, copyright, TUV, GS-Mark, UL, and CSA symbols are provided as standard designs on the Code V, and you can also define custom symbols.

**Reverse and Shaded Print** permit highlighting and contrasting by printing white characters on a dark background or white characters on a gray, shaded background. Various levels or patterns of gray shading and reverse printing may combine with the many other print features to create distinctive designs.

Automatic Increment/Decrement Capability allows batch form processing. Individual alphabetic, numeric, and bar code data fields can be identified and automatically incremented or decremented by any amount, beginning from a specified reference point.

**Standard Character Sets** provide you with many different character sets. Based on the Multinational Character Set, you may create your own character sets using characters defined and stored in flash memory.

### **ASCII Emulation**

The ASCII Emulation permits the printer to emulate an extensive selection of line and dot matrix printers.

### **Emulation Setup Menu Items**

The following list describes all menu items in the Menu Emulation Setup Functions top-level menus.

### **^Dnn Dot Slew**

(From page 78.)

**Low Resolution.** Sets the dot slew command dot values to be interpreted as 60 dpi P-Series dots.

**High Resolution.** Sets the dot slew command dot values to be interpreted as print engine dots.

The factory default is Low Resolution.

### 20 CPI Condensed

(From page 79 and page 80.) 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**. Prints about 60 percent of 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.

The factory default is Enable.

### 5225 World Trade

(From page 77.)The 5225 emulation has a standard multinational character set that serves as a base and 14 extended world trade character set assortments.

The factory default is Standard Char.

### Absorb After ^PN

(From page 78.)

- **Disable.** All line terminators that immediately follow the ^PN command are sent to the printer and processed.
- Enable. All line terminators that immediately follow the ^PN command are ignored.

The factory default is Disable.

### Absorb after ^PY

(From page 78.)

- Absorb Motion. Prevents paper motion following a system terminator in a graphics ^PY command.
- **Absorb All.** The system ignores all the data and terminator until a host generated terminator is detected.
- **Disable.** System terminators following a graphics command are sent to the printer and result in paper motion.

The factory default is Absorb Motion.

#### **Active Char Set**

(From page 77.) Selects which group of character sets (Primary or Secondary) will be active.

The factory default is Secondary Set.

#### AI 00 Spaces

(From page 78.) This option is designated for EAN/UCC-128 barcodes whose application identifier (AI) is 00.

- Disable. The printable data field is printed with the AI enclosed in parentheses. This is the standard EAN/UCC-128 format.
- **Enable**. The printable data field is printed with the UCC fields separated by spaces. This option is IGP-X00 compatible.

The factory default is Disable.

#### Alt. Set 80-9F(ASCII Emulation)

(From page 78 through page 80.)

- Printable. Prints data in the range of hex 80 through hex 9F.
- Control Code. Interprets data in the range of hex 80 through hex 9F as a control code.

The factory default is Control Code.

### Alt. Set 80-9F (Coax, Twinax)

(From page 77.)

- Printable. Prints data in the range of hex 80 through hex 9F.
- **Control Code**. Interprets data in the range of hex 80 through hex 9F as a control code.

The factory default is Printable.
## **Append Rotated**

(From page 78.)

- Disable. Logos and alphanumeric strings are treated as separate elements.
- **Enable.** Appends logos to an alphanumeric string rotated in a clockwise, counterclockwise, or inverted orientation.

The factory default is Disable.

## Auto LF (P-Series, P-Series XQ)

(From page 78 and page 79.) This option defines the printer action when print data is received past the forms width setting.

- **Disable**. Discards any data past the forms width.
- Enable. Performs an automatic carriage return and line feed when data is received past the forms width.

The factory default is Disable.

### Auto LF (Serial Matrix, Proprinter XL, Epson FX)

(From page 79 through page 80.) This option defines the printer action when print data is received past the forms width setting.

- Disable. Discards any data past the forms width.
- Enable. Performs an automatic carriage return and line feed when data is received past the forms width.

The factory default is Enable.

### Auto Skip at End

(From page 77.) Specifies whether to perform an automatic form feed at the end of a print buffer. If form feed is the last character in the print order, the form feed function is supplied by the Auto Skip At End option.

- Off. Sets the printer to print at print position 1 of the next line.
- On. Sets the printer to print at print position 1 of the first line of the next form.

The factory default is Off.

### Auto Uppercase

(From page 78.) This parameter enables the printer to print text in all uppercase when using the ALPHA command.

- **Disable.** The printer will print text in upper and lowercase.
- Enable. The printer will print text in uppercase only.

The factory default is Disable.

## Autoeject (IGP)

(From page 78.) If the last page of a job is not full, that is, the data does not fill the entire page, you can instruct the printer to eject the page or to stop and hold the page at the last print position.

- Enable. The printer ejects the last page after the entire job has been processed and printed.
- **Disable.** The default. The printer does not eject the last page unless you send a Page Eject command or until the printer receives another print job.

The factory default is Disable.

# Autoeject (Code V)

(From page 78.) Determines paper handling upon exiting the Code V Repeated Form and Dynamic Form commands. DISABLE holds the print position at the bottom of the form. ENABLE issues a form feed after the last form is printed so all pages will be physically printed.

The factory default is Disable.

### Autowrap

(From page 78.) This parameter determines if text will wrap to the next line when the line of text exceeds the right margin.

- Disable. 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.

The factory default is Disable.

## **Barcode Errors**

(From page 78.)

**Enable.** An error message will print when invalid bar code data is encountered.

**Disable.** Code V will not print an error for illegal bar code data; the bar code will be skipped.

**NOTE:** When Barcode Errors is disabled, the Code V emulation will try to make the best use of invalid data by either truncating extra digits or adding zeros to the end of bar code data to meet minimum data length requirements for some bar codes. Not all errors will be corrected.

The factory default is Enable.

## Bold

(From page 79.)

- **Disable**. Text is printed normally.
- Enable. Text is printed with a heavy line thickness.

The factory default is Disable.

## **Bottom Margin**

(From page 78 through page 80.) Defined in linespaces, starting from line zero at the bottom of the page and incrementing from the bottom up.

The factory default is 0.

## **Btm Margin Ctl**

(From page 78.) Determines the page's bottom margin. If this option is set to Code V Text Length, then Text Length changes the bottom margin value in the ASCII Emulation sub-menu as follows: bottom = physical page length-top margin-text length. If the option is set to ASCII Emulation Menu, then a change in text length has no effect and the bottom margin setting in the ASCII Emulation menu will be used although the new text length value still shows in the menu.

The factory default is ASCII Emulation Menu.

### **Buffer Print**

(From page 77.)

- **Disable**. The printer will print normally.
- **Enable**. The printer prints the EBCDIC data and control codes received from the host as hex values.
- **NOTE:** Use of this parameter may alter print attributes set by the host computer. A power cycle may be required after changing Buffer Print from enable to disable.

The factory default is Disable.

### **Buffer Reprint**

(From page 77.) This option is valid only when the printer is printing in Coax SCS mode. When the ENTER key is pressed, "Buffer Reprint Enabled" is displayed and an Intervention Required status is sent to the host. Pressing ENTER again cancels the Buffer Reprint function and "Buffer Reprint Disabled" is displayed.

# **Cancel IGP/DCU**

(From page 77.)

- **Enable**. Cancels all buffers when a job is put on hold from the host or when the CANCEL key is pressed.
- **Disable**. Does not cancel any internal buffer in the printer when a job is put on hold from the host, or when the CANCEL key is pressed.

The factory default is Enable.

# **Change Case**

(From page 77.) Specifies the font as Mono or Dual case. This option is available only in Coax non-SCS mode. The host will be notified of the change when the printer is put 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.

The factory default is Dual Case.

\* = Factory Default

# **Character Group (IGP)**

(From page 78.) This menu item selects the character set used by the printer. The available character sets are shown below.

Standard Sets*	Arabic Sets	Cyrillic Sets	European Sets	Greek Sets
0) ASCII* 1) German 2) Swedish 3) Danish 4) Norwegian 5) Finnish 6) English 7) Dutch 8) French 9) Spanish 10) Italian 11) Turkish 12) CP 437 13) CP 850 14-23) Reserved 24-31) User Def.	ASMO 449* ASMO 449+ ASMO 708 ASMO 708+ MS DOS CP710 MS DOS CP720 Sakr CP 714 Aptec CP715 CP 786 IBM CP 864 IBM CP 864 IBM CP 1046 Arabic Lam One Arabic Lam Two Win. CP 1256	Code Page 866* Cyrillic CP 437 Cyrillic 113 Cyrillic 8859-5 ISO 915 Code Page 855 Cyrillic 7-bit Ukrainian Bulgarian Win. CP 1251	Latin 2 8859-2* Code Page 852 Mazovia Kamenicky Roman 8 PC-437 Slavic Slavic 1250 Code Page 865 Code Page 860 Latin 1 8859-1 Latin 5 8859-9 Latin 9 8859-15 Polish POL 1 Win. CP 1250 Win. CP 1252 Win. CP 1257	DEC 256 Greek* ELOT 928 Greek Greek 3 ABY Greek ABG Greek ELOT 927 Greek Greek 851 Greek 437 Greek 8859-7 Win. CP 1253
Hebrew Old* Hebrew Old* Hebrew DEC Latin-1 Hebrew Win. CP 1255	Turkish Sets Data Gen. Turkish* DEC Turkish IBM Turkish Siemens Turkish PTT Turkish IBC Turkish Bull Turkish Bull Turkish Unisys Turkish NCR Turkish PST Turkish UNIS-1 Turkish Code Page 853 INFO Turkish Win. CP 1254 Code Page 857			

NOTE: The desired basic character set is accessed by the + and - keys and selected by pressing the → key. After the basic set has been selected, the subset selection menu is accessed by pressing the ↓ key. Once in the subset menu, accessed the desired subset by pressing the + and - keys and select by pressing the ↓ key.

# Character Group (Code V)

(From page 78.) This menu item selects the character set used by the printer. The available character sets are shown below.

#### \* = Factory Default

Standard Sets*	Arabic Sets	Cyrillic Sets	European Sets	Greek Sets
0) ASCII*	ASMO 449*	Code Page 866*	Latin 2 8859-2*	DEC 256 Greek*
1) German	ASMO 449+	Cyrillic CP 437	Code Page 852	ELOT 928 Greek
2) Swedish	ASMO 708	Cyrillic 113	Mazovia	Greek 3
3) Danish	ASMO 708+	Cyrillic 8859-5	Kamenicky	ABY Greek
4) Norwegian	MS DOS CP710	ISO 915	Roman 8	ABG Greek
5) Finnish	MS DOS CP720	Code Page 855	PC-437 Slavic	ELOT 927 Greek
6) English	Sakr CP 714	Cyrillic 7-bit	Slavic 1250	Greek 851
7) Dutch	Aptec CP715	Ukrainian	Code Page 865	Greek 437
8) French	CP 786	Bulgarian	Code Page 860	Greek 8859-7
9) Spanish	IBM CP 864	Win. CP 1251	Latin 1 8859-1	Win. CP 1253
10) Italian	IBM CP 1046		Latin 5 8859-9	
11) Turkish	Arabic Lam One		Latin 9 8859-15	
12)CP 437	Arabic Lam Two		Polish POL 1	
13) CP 850	Win. CP 1256		Win. CP 1250	
			Win. CP 1252	
			Win. CP 1257	

Hebrew Sets	Turkish Sets		
Hebrew Old*	Data Gen. Turkish*		
Hebrew New	DEC Turkish		
Hebrew DEC	IBM Turkish		
Latin-1 Hebrew	Siemens Turkish		
Win. CP 1255	PTT Turkish		
	IBC Turkish		
	Bull Turkish		
	AS400 Turkish		
	Unisys Turkish		
	NCR Turkish		
	PST Turkish		
	UNIS-1 Turkish		
	Code Page 853		
	INFO Turkish		
	Win. CP 1254		
	Code Page 857		

NOTE: The desired basic character set is accessed by the + and - keys and selected by pressing the → key. After the basic set has been selected, the subset selection menu is accessed by pressing the ↓ key. Once in the subset menu, accessed the desired subset by pressing the + and - keys and select by pressing the ↓ key.

## Character Group (Epson FX)

(From page 80.) This menu item selects the character set used by the printer. The available character sets are shown below.



NOTE: The desired basic character set is accessed by the + and - keys and selected by pressing the → key. After the basic set has been selected, the subset selection menu is accessed by pressing the ↓ key. Once in the subset menu, accessed the desired subset by pressing the + and - keys and select by pressing the → key. The Epson subset is accessed and selected in the same manner.

## **Character Group (Proprinter XL)**

(From page 79.) This menu item selects the character set used by the printer. The available character sets are shown below.



NOTE: The desired basic character set is accessed by the + and - keys and selected by pressing the → key. After the basic set has been selected, the subset selection menu is accessed by pressing the ↓ key. Once in the subset menu, accessed the desired subset by pressing the + and - keys and select by pressing the → key. Character subsets are accessed and selected in the same manner.

# Character Group (P-Series, Serial Matrix)

(From page 79.) This menu item selects the character set used by the printer. The available character sets are shown below.



NOTE: The desired basic character set is accessed by the + and - keys and selected by pressing the → key. After the basic set has been selected, the subset selection menu is accessed by pressing the ↓ key. Once in the subset menu, accessed the desired subset by pressing the + and - keys and select by pressing the → key. Primary and extended character subsets are accessed and selected in the same manner.

## **Character Set**

(From page 79.) This menu item allows selection of the character set to be used by the printer.

#### **Cmd Resolution**

(From page 78.)

- Low Resolution. Sets a low command resolution mode.
- High Resolution. Sets a high command resolution mode.

The factory default is Low Resolution.

### Coax Type

(From page 77.) This parameter defines the printer emulation, as follows:

- 4234
- 3287

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

The factory default is 4234.

## **Compressed Print**

(From page 79.) Controls which host command sets compressed printing.

- CHAR 01 SOH
- CHAR 03 ETX
- CHAR 09 HT

The factory default is char 01 SOH.

## **Control Code 06**

(From page 78.) Control Code 06 defines the function of ASCII code 06 hex (ACK). You can select an alternate line spacing of 6, 8 or 10.3 LPI.

The factory default is 8.

## **Control Code 08**

(From page 78.) Control Code 08 defines the function of ASCII code 08 hex (BS). You can define the code to output an elongated character or a backspace.

The factory default is Elongated.

#### Copy Count

(From page 78.) Determines the number of identical copies of each physical page that will be printed.

The factory default is 1.

## CR at MPP+1

(From page 77.) MPP is Maximum Print Position, which is also known as line length. This option controls a carriage return at the end of a print line and at MPP+1.

- **On**. 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.

The factory default is On.

## **CR Edit**

(From page 78.) This parameter determines if a carriage return will be followed by a line feed.

- **Disable.** 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.

The factory default is Disable.

## CR, EM, and NL

(From page 77.) 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. Treats the CR, EM and NL commands as control codes.
- Off. Treats the CR, EM and NL commands as spaces.

The factory default is On.

## Data Bit 8

(From page 78.)

- **Enable.** 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, data bit 8 internally indicates PI line status. To use the PI line, disable data bit 8, and enable the Host PI configuration option (under the PI Control option, below).

**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.

The factory default is Enable.

## **Define CR Code**

(From page 78.) This option controls the action of the printer when it receives a Carriage Return code (0D hex) from the host computer. If this feature is enabled, each time the printer receives a Carriage Return, it inserts an additional Line Feed code (0A hex) into the data stream. Do not use this feature if the host computer sends Line Feeds to the printer.

- **CR = CR**. 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.

The factory default is CR.

# Define LF Code (IGP, Serial Matrix, Proprinter, Epson FX)

(From page 78 and page 79.) 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 = CR + LF. Performs an automatic carriage return. The next print position will be 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.

The factory default is LF.

# Define LF Code (P-Series, P-Series XQ)

(From page 78 and page 79.)

- LF = CR + LF. Forces an automatic carriage return with each line feed command received. The next print position is 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.

The factory default is CR+LF.

# Do FF at TOF

(From page 78.) Determines whether the printer, with media already set at the TOF (Top-of-form) position, will advance media to the next TOF position upon receipt of a FF command.

- **Enable.** The printer will advance media from the present TOF position to the next TOF position upon receipt of a FF command, causing a blank form.
- **Disable.** The printer will not advance media from the present TOF position to the next TOF position upon receipt of a FF command.

The factory default is Enable.

# Early Print Compl (Coax)

(From page 77.) Early Print Comp capability allows the printer to send print (order) complete status to the host before the printer is actually done printing all data. This option is valid only when the printer is in DSC/DSE mode.

- ENABLE means the printer will send an acknowledgement to the host when it is able to accept more data.
- DISABLE means the printer will suppress the Early Print Complete response until all printing is complete.
- **NOTE:** When an Early Print Complete is enabled and an error occurs, there may be data loss experienced.

The factory default is Disable.

# **Elong./Alt. Font**

(From page 79.) Controls which host command sets elongated (double high) fonts and extended character set.

- ELNG=BS (08 hex) FONT=SO (0E hex)
- ELNG=SO FONT=BS

The factory default is EIng=BS Font=SO.

# **Epson Set**

(From page 80.) This menu item allows selection of the desired Epson character subset used by the printer.

The factory default is ASCII (USA).

## **Error Markers**

(From page 78.)

• **Enable.** 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.

The factory default is Enable.

## **Error Msgs**

(From page 78.)

- **Enable.** Command syntax is checked and error messages printed when command parameters are incorrect.
- Disable. Error checking and error messages are suppressed.

The factory default is Enable.

## **Error Report**

(From page 78.) This menu item sets the error reporting capability of the printer for IGP forms. The selections are the following:

- **On.** Full error boundary checking reported. Any element that falls off the current page is reported as an error.
- **Debug Mode.** Puts the printer in debug mode whenever a form is defined in CREATE mode. Each line of the CREATE form will be printed along with an error if one occurred.
- **Off.** There is no form boundary checking whatsoever. Graphic elements such as alpha, line, barcodes, etc. will be clipped if they are beyond the page boundaries.
- Fault. Allows the user to halt the printer if an IGP error occurs. If this option is selected, the IGP error is printed on paper, the message "IGP Error" is displayed on the front panel, then the printer will go offline. The error must be cleared before the printer can resume normal operation.

The factory default is On.

## ESC d Command

(From page 79.) This menu option is for backward compatibility.

- Even dot plot: This option interprets ESC d command as even dot plot.
- Double high: This option interprets ESC d Command as double high. Select this option for backward compatibility.

The factory default is Even dot plot.

## **EVFU Select**

(From page 79.) Controls how the printer handles vertical formatting.

- Enable. Selects P-Series compatible Electronic Vertical Format Unit (EVFU).
- **Disable**. Disables all EVFU processing.

The factory default is Enable.

## Ext Execute Copy

(From page 78.)

- **Disable.** 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 compatible.)
- Enable. Dynamic data, overlay data, etc. are allowed within a form where the Form Count parameter is specified in the Execute command. In this case, the same form is printed for whatever the Form Count is. Incremental data is not incremented since the printing page is the same. The overlay data is only printed with the first form and not on subsequent forms, and each form is printed on a separate page.

The factory default is Disable.

## **Extended Subset**

(From page 78.) This menu item allows selection of the desired extended character subset used by the printer.

## **FF After Job**

(From page 77.) Determines the print position after an operator-initiated local copy (print screen function).

- Off. 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.

The factory default is Off.

## **FF Valid At TOF**

(From page 78.) The FF Valid at TOF option determines whether the printer will perform a Form Feed when the host sends a Form Feed command, if 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.

Enable performs a form feed when the host sends a Form Feed command and the printer is at the top of form.

The factory default is Enable.

#### **FF Validity**

(From page 77.) Determines if the position of a form feed command affects its execution.

- Off. Performs a form feed only if it occurs at the first print position in a line or at Maximum Print Position +1. 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.

The factory default is Off.

#### Forms Length (in.)

(From page 78 through page 80). Forms length is the number of lines that can be printed on a label. You can set forms length in inches.

The factory default is shown in Table 2 on page 92.

## Forms Length (lines)

(From page 78 through page 80.) Forms length is the number of lines that can be printed on a label. You can set forms length as a function of the current LPI (lines per inch).

The factory default is shown in Table 2 on page 92.

#### Forms Length (mm)

(From page 78 through page 80.) Forms length is the number of lines that can be printed on a label. You can set forms length in millimeters.

The factory default is shown in Table 2 on page 92.

#### Form Width (char.)

(From page 78 through page 80.) The forms width can be specified as a function of the current CPI (characters per inch). The forms width set should not exceed the actual paper width.

The factory default is the maximum printing width divided by the selected number of characters per inch.

### Form Width (in.)

(From page 78 through page 80.) The forms width can be specified in inches, millimeters, or as a function of the current CPI (characters per inch). The forms width set should not exceed the actual paper width.

The factory default is the maximum printing width.

# Form Width (mm.)

(From page 78 through page 80.) The forms width can be specified in inches, millimeters, or as a function of the current CPI (characters per inch). The forms width set should not exceed the actual paper width.

The factory default is the maximum printing width.

# **Format Control**

(From page 77.) Enables the printer to reflect the same spacing as CTPC model printers after absolute and relative move commands are executed.

- **Disable**. Reflects distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after horizontal and vertical tabs are executed).
- **Enable**. Does not reflect distance, generated by the Code V feature, IGP feature, and Hex Transparent control code sequence, in the new position (after horizontal and vertical tabs are executed).

The factory default is Disable.

# **Gothic Typeface**

(From page 79.) Controls which host command sets high speed printing.

- CHAR 02 STX
- CHAR 03 ETX
- CHAR 09 HT

The factory default is char 02 STX.

# **Graphic Chek Code**

(From page 77.) Specifies the replacement character to print in place of any unprintable character that is received from the host. Choose a hex character from 40 through FE. 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 Graphic Chek Err parameter is disabled.

The factory default is 60.

### **Graphic Chek Err**

(From page 77.) Allows overriding of the host setting for the SGEA (Set Graphic Error Action) command. For more information about the SGEA command, refer to the *Coax/Twinax Programmer's Reference Manual*.

- **Enable**. The host setting for the SGEA 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 Graphic Chek Code parameter.

The factory default is Enable.

### Hex Dump Mode

(From page 77.) Hex dump mode allows you to place the printer into the "hex dump" mode, in which the printer outputs a hexadecimal data stream. The purpose of hex dump mode is to see exactly what data is received by the printer, in order to debug forms, for example.

When enabled, the hex dump mode translates all host interface data to its hexadecimal equivalent, then prints the hex code and its printable symbol, if one exists. Figure 5 shows a partial example of a hex dump.

After the printer enters hex dump mode, all characters it prints (including any in the printer's input buffer) are printed in two forms: as a two-symbol hexadecimal code, and as the character's printable symbol (if it has one). A non printable code is printed as a period [.] symbol. Up to 16 characters can be printed per line of hex dump printout. While the printer is in hex dump mode, it does not act upon any control codes, other than to print their hexadecimal equivalents.

The 16 characters printed per line on the hex dump are formatted so that the 16 printable symbols are printed in columns 1 through 16. The 17th column is blank. Column 18 contains either a p (PI line active) or a blank (PI not active). Columns 19 and 20 contain the hexadecimal code for the first character, followed by a blank. The PI line condition and hexadecimal code for the second character are printed in columns 22, 23, and 24, followed by a blank. The third through 16th characters are printed in a similar manner. The hexadecimal code for the 16th character is printed in columns 78, 79, and 80.

Subsequent printing observes the current setting for skip-over perforation, form length, and top-of-form position parameters.

If a fault occurs while printing a hex dump, the printer reverts to the normal fault state. When the fault is cleared, the printer resumes printing the hex dump (either a partial line with a form feed, or nothing at all). Top-of-form remains unaffected.

he Impact Prin 09 54 68 65 2049 6D 70 61 63 20 74 50 72 69 őΕ · Emulation pr 74 65 72 20 45 6D 75 6C 61 74 69 6F őΕ 20 70 72 ;s in one-up... 69 6E 74 73 20 69 6E 20 6F 6E 65 2D 75 70 2Ç 0A w-up, and fou 09 74 77 6F 2D 75 70 2C 20 61 6E 2Q 64 66 6F 75 ip page window 72 20 75 70 20 70 61 67 65 20 77 69 6E 64 δF 77 73 2E . . 0Ċ 0D 0A

#### Figure 5. Sample Hex Dump

To begin a hex dump, first place the printer offline and enable the Hex Dump Mode option from the control panel. Next, place the printer online. Finally, send data to the printer from the host computer. Any data received from the host is "dumped" to the printout.

To cancel a hex dump, first place the printer offline. Then, disable the Hex Dump Mode option from the control panel. The paper may then be advanced to the next top-of-form.

## **Horizontal DPI**

(From page 78.) This feature enables the thermal printer to print images as close as possible to the same size as those originally programmed for a line matrix or laser printer by selecting a horizontal resolution that matches that of the printer that the file was originally generated for.

Although the range allows a selection of up to 400 dpi, the 4400 is capable of printing up to 203 (4400-004, 4400-006, 4400-008) and 300 (4400-004, 4400-006, 4400-008) dpi horizontal resolution.

The factory default is 120.

### **Host Command**

(From page 79.) This menu item allows the user to select certain host commands to be ignored by the printer.

The factory default is Enable (all host commands accepted by the printer).

## Host Form Length (IGP)

(From page 78.) Determines how the physical label size is affected upon an EXECUTE command.

- **Disable.** Forms printed in EXECUTE mode do not change the physical label size. Therefore, the size of the form (defined in CREATE mode) must fit within the current label dimensions, or errors may occur.
- Enable. The physical label length will change to match the form length (defined in CREATE mode). The physical label size remains at the new setting until another EXECUTE command is received, or the PRINTER CONTROL menu settings are changed.
- **NOTE:** Changing the form length via the EXECUTE command changes the ASCII Emulation logical dimensions.

The factory default is Enable.

## Host Forms Length (Code V)

(From page 78.) Sets the printer page size. DISABLE sets the printer label size equal to the Label Length set in the front panel under the PRINTER CONTROL menu. ENABLE sets the printer page length equal to the software host form length.

The factory default is Enable.

### **Host Override**

(From page 77.) Determines whether the printer accepts certain commands sent by the host, or continues to use the current operator panel settings.

- **Disable**. Allows these host commands to override operator panel settings: line length, forms length, lines per inch (LPI), characters per inch (CPI), print quality, and text orientation. Note 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**. The operator panel settings override the host commands.

The factory default is Disable.

#### Host Pl

(From page 78.)

- **Disable.** The host does not send PI signals.
- **Enable.** The host sends PI signals. The Data Bit 8 configuration option must be disabled to transmit the PI line to the printer.

The factory default is Disable.

# I-2/5 Selection

(From page 78.) This option is added to be compatible with a special IGP-X00 customization. Usually, if Interleaved 2/5 bar codes have an odd number of digits, a leading zero is inserted in front of the data. However, this special IGP-X00 customization gives you the option of adding a space character at the end of the bar code instead.

- Leading Zero. A leading zero is inserted in front of the data.
- **Trailing Space**. A space is inserted at the end of the data instead of a leading zero.
- **X2 DPD**. When selected, I-2/5 bar code with a magnification X2 will use the specially configured ratios 3:3:6:5 rather than 3:6:9:12 for compatibility issues.
- **Modulo 7 CD**. The I-2/5 bar code uses a modulo 7 check digit instead of the default modulo 10 check digit.

The factory default is Leading Zero.

# **Ignore Ch#1**

(From page 78.) Specifies character 1 for the character filtering option. Valid decimal values are from 0 through 255.

The factory default is 0.

# Ignore Ch#2

(From page 78.) Specifies character 2 for the character filtering option. Valid decimal values are from 0 through 255.

The factory default is 0.

# **Ignore Chars**

(From page 78.)

- **Disable.** Character filtering is not enabled.
- **Char 1.** Character 1 will be filtered. Select the option "Ignore ch#1" to specify character 1.
- **Char 2.** Character 2 will be filtered. Select the option "Ignore ch#2" to specify character 2.
- **Char 1&2.** Characters 1 & 2 will be filtered. Select the options "Ignore ch#1" and "Ignore ch#2" to specify values for these characters.

The factory default is Disable.

## **Ignore Dots**

(From page 78.)

- Disable.
- Enable. Causes the Code V to expect position values to be specified in only 1/10ths of an inch. If the dot position is also given, it is treated as text.

The factory default is Disable.

#### Ignore Mode

(From page 78.) This parameter instructs the IGP to ignore the character selected under the Select Character menu.

**Disable.** The IGP does not ignore any characters.

**Enable.** The IGP ignores the character specified in the Select Character menu.

The factory default is Disable.

#### Ignore Spaces

(From page 78.)

- Disable. Trailing spaces are not deleted from alphanumeric elements in a graphics pass.
- Enable. Trailing spaces are deleted from alphanumeric elements in a graphics pass.

The factory default is Disable.

#### Ignore Text

(From page 78.) When enabled, any line of text (non-PGL commands) in Normal mode will be ignored. When disabled, text in Normal Mode will be printed. Attributes to be printed depend on the PGL Normal menu setting.

The factory default is Disable.

#### IGP 100 Compatibl.

(From page 78.) This parameter forces the output to correspond with IGP 100 printer output in cases where there are differences.

The factory default is disable.

### Intervention Req

(From page 77.)

- **Send to Host**. The printer sends a signal to the host computer when a printer fault or hold mode time-out occurs.
- Do Not Send. No signal will be sent to the host computer.

The factory default is Send to Host.

## **Italic Print**

(From page 78.)

- **Disable**. Text is printed normally.
- Forward Slant. Text is printed with a forward slant.
- **Backward Slant**. Text is printed with a backward slant.

The factory default is Disable.

## LAC Option

(From page 77.) 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. Prints the LAC character as defined.
- **Disable**. Ignores the LAC definition from the host and prints from the currently selected character set.

The factory default is Enable.

## Last Char = FF

(From page 77.) Determines the print line position when a form feed command is the last code encountered in the print buffer.

- **On**. 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 Auto Skip At End 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.

The factory default is On.

## Lead-in Chars

(From page 77.) You can enable additional printer features which are not accessible through standard coax emulations. To access these features, send text commands in the data stream. The commands must have a start and end code. 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: \_

The factory default is Set1<%>.

# Left Margin

(From page 79.) Set in characters. Character zero is defined as the far left edge of the page, and column numbering increments from left to right.

The factory default is 0.

## Logical Buff Size

(From page 77.) Refers to the size of the printer buffer, which should be set the same as the host screen (buffer) size. If the host screen size is unknown, use 1920.

The factory default is 1920.

# LPI

(From page 78.) This menu item selects the number of lines printed per inch. The factory default is 6.

### Max PI 16

(From page 78.)

- Enable. 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 always move 1 line.

The factory default is Enable.

### Max. Print Width

(From page 77.) Set the maximum print width the printer will print when using a C/T host interface. Set for 13.2 inches when printing files larger than the width of the printer. All data exceeding the width of the maximum Printer Width will be truncated.

- 13.2 inches
- Printer Width (the maximum width of the printer)

The factory default is 13.2 inches.

### Midline PY (includes ^PN)

(From page 78.)

- Disable. The Graphics mode Enabled command, ^PY, must be the first three characters of a line.
- Enable. The ^PY or ^PN can occur anywhere in a line.

The factory default is Disable.

### NL at MPP+1

(From page 77.) Controls how many lines are skipped when the carriage returns to a new line.

- **On**. 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.

The factory default is On.

### **Null Handling**

(From page 77.) This item allows the printer to either treat nulls as blank spaces or ignore them. If nulls are ignored, the print position does not move.

- OFF Ignores nulls
- ON Treats nulls as spaces

The factory default is Space.

## Null Suppression (Coax)

(From page 77.) This item allows the printer to either treat nulls as blank spaces or ignore them. If nulls are ignored, the print position does not move.

- OFF Ignores nulls
- ON Treats nulls as spaces

The factory default is Off.

## **Offpage Errors**

(From page 78.)

- **Disable.** 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.

The factory default is Disable.

### **Optimized Ratio**

(From page 78.) 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 the IGP-X00 printers.

- Disable. Use standard bar code ratios.
- Enable. Select the alternate bar code ratios.

The factory default is Disable.

## Overstrike

(From page 79.) Overstrike determines the action required when a line is printed over a previous line because a carriage return was received without a line feed.

- Enable. Prints the second line on top of the first line.
- Disable. Replaces the characters from the first line with the second line.

The factory default is Enable.

## PA1

(From page 77.) PA1 is only valid when the printer is in the offline 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 put back in online mode. Refer to the *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

(From page 77.) PA2 is only valid when the printer is in the offline 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 put back in online mode.

**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.

## **IGP Normal**

(From page 78.) This parameter allows you to select whether the attributes associated with text printed in the IGP Normal mode are controlled by the IGP menu or the ASCII menu.

- ASCII Emulation Menu. The default. IGP Normal mode text is printed with the attributes defined in the ASCII menu.
- **IGP Menu.** IGP Normal mode text default is printed with the attributes defined in the IGP menu.

The factory default is ASCII Emulation Menu.

### **PI Slew Range**

(From page 78.) You can specify how many lines the paper will feed.

- **15.** A paper slew of 1-15 will move 1-15 lines. A paper slew of 0 will move 1 line.
- 16. A paper slew of 0-15 will move 1-16 lines.

The factory default is 16.

### Position Aft FF (4234 only)

(From page 77.) Allows you to select the location of the print position after a form feed command is sent.

- Off. 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.

The factory default is Off.

## **Power On IGP**

(From page 78.) You can set the IGP feature so that it is enabled or disabled when the printer is powered on.

- Enable. 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.)

The factory default is Enable.

## Power Up ^F

(From page 78.)

- **Disable**. The default.
- Enable. Selects free format mode as the power-up default, and selects the graphics mode ^PY as the power-up default. Free format causes the Code V to ignore carriage returns, line feeds and all characters below 20 hex sent from the host.

The factory default is Disable.

### Power Up ^PY

(From page 78.)

- **Disable**. The default.
- Enable. Selects the graphics mode ^PY as the power-up default.

The factory default is Disable.

## Power Up ^X

(From page 78.)

- **Disable**. The default.
- Enable. Selects the ignore mode as the power-up default, and selects the graphics mode ^PY as the power-up default. All characters are ignored until a ^A command is received.

The factory default is Disable.

# **Primary Sets (Coax)**

(From page 77.) This menu item specifies the primary character set used by the printer. Available selections are shown below.

	Char Set Select		* = Factory Defau	lt
	Primary Sets		Secondary Sets	
0037 English US* 0037 Eng Nether 0285 English UK 0273 Austr/Germ 0274 Belg. Old 0275 Brazilian 0260 Canad Fren 0277 Danish 0287 Danish Alt 0278 Finnish 0288 Finnish Alt 0297 French 0500 Internat. 5 0280 Italian 0281 Japan. Eng 0282 Portuguese 0284 Span Speak 0289 Span. Alt 0500 Swiss Bil	0500 Belg. New 0803 Hebrew Old 0424 Hebrew 0892 OCR A 0893 OCR B 0420 Arabic 0880 Cyril. Old 0423 Greek Old 0875 Greek New 0871 Icelandic 0290 Japan Kata 0870 Latin 2 0838 Thai 1026 Turkish 0890 Yugos. Old 1097 Farsi 1025 Cyrillic 0905 Turk. Old 0256 Intern. 1 0924 Euro Lat-9	1140 Euro Eng. 1141 Euro Aust. 1142 Euro Dan. 1143 Euro Finn. 1144 Euro Ital. 1145 Euro Span. 1146 Euro Eng. 1147 Euro Fren. 1148 Euro Swiss 1149 Euro Ice.		

Specifies the print language used by the printer.

The factory default is English US.

## Primary Sets (Twinax)

(From page 77.) This menu item specifies the primary character set used by the printer. Available selections are shown below.



Specifies the print language used by the printer. The factory default is English US.

### **Primary Subset**

(From page 138.) This menu item allows selection of the desired primary character subset used by the printer.

## **Print Char. Set**

(From page 79 and page 80.) Selecting this menu item by pressing the  $\downarrow$  key causes the printer to print the currently selected character set.

### **Printer PI**

(From page 78.)

- Disable. The ASCII Emulation is configured with the PI line disabled.
- Enable. The ASCII Emulation is configured with the PI line enabled.

The factory default is Disable.

## **Printer Select**

(From page 79.)

- **Disable**. 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.

The factory default is Disable.

## **Prop Line Length**

#### (From page 78.)

- **Enable.** The default. The position of the next graphic element will be determined by the physical length of a text string (when using a proportional spaced font).
- Disable. The position of the next graphic element will be determined as if the font was monospaced (all characters had the same specified width).

The factory default is Enable.

### **Prop Spacing**

(From page 78.) 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**. Each character cell is printed with the same width. Each column in the printed text will line up.
- **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.

The factory default is Enable.

# **Prt Partial Line**

(From page 77.)When this option is enabled, it forces the printer to print if a partial line is in the printer (i.e. line not ending with a LF). When disabled, the last partial line of data will not be printed.

The factory default is Enable.

# **PSeries Dbl High**

(From page 78.) This menu option allows printing compatibility between the current and older models of IBM printers.

- Normal: This is normal Double High printing for current model printers.
- P3/4/6/9 Compat: Where older printers printed two dot rows higher, this option allows for compatibility by raising the print two dot rows to match the current models dot row value (two dot rows lower).

The factory default is Normal.

# Repeat Form Opt

- **Enable.** Speeds up the processing of repeated forms for PGL, thereby resulting in increased printer throughput. This option provides no speed benefit for forms that are unrelated to one another and should be disabled under those circumstances.
- **Disable.** Should be selected when subsequent forms are unrelated to one another.

The factory default is Enable.

# Reset Cmd CFG Ld

(From page 78.) When the printer receives a host data stream reset command (ESC @ or ESC[K) in addition to resetting printer variables, the power up configuration will be loaded.

- **Disable:** The factory configuration is loaded when the reset command is executed.
- **Enable:** The power up configuration is loaded when the reset command is executed.

The factory default is Disable.

## **Right Margin**

(From page 79 and page 80.) Set in characters. Character zero is defined as the far right edge of the page, and column numbering increments from right to left.

The factory default is 0.

## Rot. Char Size

(From page 78.)

- Adjusted. Rotated (clockwise/counterclockwise), expanded characters have a different size than an unrotated character with the same size parameters.
- **Not Adjusted.** Rotated, expanded characters will be the same size as unrotated characters with the same size parameters.

The factory default is Adjusted.

### Secondary Sets (Coax)

(From page 77.) This menu item specifies the secondary character set used by the printer. Available selections are shown below:

\* = Factory Default



The factory default is English US.

\* = Factory Default

# Secondary Sets (Twinax)

(From page 77.) This menu item specifies the secondary character set used by the printer. Available selections are shown below.



The factory default is English US.

# **Select Char**

(From page 78.) Instructs the IGP which decimal character (0-255) to ignore from the host.

The factory default is 0.

## Select CPI

(From page 78.) This menu item selects the characters per inch (CPI) value. The factory default is 10.

## Select LPI

(From page 78.) 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 factory default is 6.

## Select SFCC (IGP)

(From page 78.) You can specify which hex code (1-255) will be used as the Special Function Control Character (SFCC). The factory default setting is 126. The SFCC denotes that the following data is a IGP command.

The factory default is Hex 126.

## Select SFCC (ASCII Emulation)

(From page 78.) This parameter allows you to select which ASCII codes will function as the Special Function Control Character (SFCC) command delimiter.

P-Series codes can use hex 00 through hex 7F. Options include the following:

- ESC (1B hex)
- SOH (01 hex)
- ETX (03 hex)
- CIRCUMFLEX (5E hex)—also called caret (^)
- TILDE (7E hex)—(~)
- **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, or print errors will occur.

The factory default is 1.

## Select SO Char

(From page 78.) Allows you to specify a decimal code from 0 through 255 to be used in place of SO (Shift Out) as the control code which allows access for the alternate set of control function characters. See the description of the Code 128 barcodes in the *IGP Programmer's Reference Manual* for details.

The factory default is 14.

## Set Text Orientn

(From page 77.) 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**. Allows printers configured as a 4234 to use the "Set Text Orientation" command from the host.
- Left To Right.
- Right To Left. When a right to left language is selected, the host will be notified of print direction changes when the printer is made READY.

The factory default is Control By Host.

# SFCC

(From page 78.) This option selects the Special Function Control Character. The default value is the caret ^ (decimal 94). Valid values are 17 through 255. Throughout this manual, the caret is used as the SFCC. Run a configuration printout to determine the currently selected SFCC.

The factory default is Hex 94.

# SFCC Char

(From page 77.) Determines what character is printed when an EBCDIC Logical Not character  $\neg$  (Hex 5F) is received from the host.

The factory default is Set 1<%>.

# SFCC d command

(From page 78.) This menu option is for backward compatibility.

- Even dot plot: This option interprets SFCC d command as even dot plot.
- Double high: This option interprets SFCC d Command as double high. Select this option for backward compatibility.

The factory default is Even dot plot.

# **Skip Cmd Prefix**

(From page 78.) Stands for Skip Command Prefix. This parameter determines if the printer will print any data before a IGP command is received.

- Enable. The printer ignores all data before an IGP command.
- **Disable.** The printer will print all data before an IGP command.

The factory default is Enable.

## Slash 0

(From page 78.) 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. Zero is printed without a slash.
- **Enable.** Zero is printed with a slash.

The factory default is Disable.

## **Slashed Zero**

(From page 78 and page 79.) 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.** Zero is printed without a slash.
- Enable. Zero is printed with a slash.

The factory default is Disable.

## **Slew Relative**

(From page 79.) "Slewing" is rapid vertical paper movement. This parameter determines the number of lines slewed (either 1-15 lines or 1-16 lines) when an EVFU Slew Relative command is received.

The factory default is 1-15 Lines.

## **SPC Char Set**

(From page 77.) Allows you to select the print language character set.

The factory default is 0500 Internat 5.

### SPC Null Supp

(From page 77.) Stands for SPC Null Suppression.

- **Disable**. Ignores nulls. The print position does not move.
- **Enable**. Treats nulls as blank spaces.

The factory default is Disable.

## SPC Type

(From page 77.)

- Avatar Comp. This option causes the printer to line wrap at 132 characters despite the current print density allowing more characters per line.
- **PTX NI (IBM Non-impact)**. This option causes the printer to not line wrap at 132 characters.

The factory default is PTX NI.

## **Standard Sets**

(From page 78.) This menu item allows the user to select various character sets (Standard, Arabic, Cyrillic, etc.) available from the "Character Group" menu item.
#### **Text Length**

(From page 78.) Is the printable length on the page below the top margin. It is in character lines at the lpi in effect when the new value is entered.

The factory default is 66.

#### **Text Position**

(From page 79 and page 80.) 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. The following example shows both Top of Line and Bottom of Line text positions:



The factory default is Bottom of Line.

#### **Top Margin**

(From page 78 through page 80.) Defined in linespaces, starting from line zero at the top of the page and incrementing from the top down.

The factory default is 0.

#### Translation Tbl (Coax)

(From page 77.) Prints out SCS and DSC/DSE tables of the coax interface's current character set. This operation is valid only when the coax interface is selected as the current interface.

#### Translation Tbl (SPC Coax)

(From page 77.) Prints out a table of the coax interface's current character set. This operation is valid only when the coax interface is selected.

#### Translation Tbl (SPC Twinax)

(From page 77.) Prints out a table of the twinax interface's current character set. This operation is valid only when the twinax interface is selected.

#### Translation Tbl (Twinax)

(From page 77.) Prints out a table of the twinax interface's current character set. This operation is valid only when the twinax interface is the current interface.

#### True Vert 1/10

(From page 78.)

- **Disable.** When disabled and in High Resolution, a vertical line's length in one inch and 1/10 inch increments is interpreted as 70/72 inch and 7/72 inch respectively.
- Enable. When enabled, a vertical line's length is interpreted exactly, which is 72/72 inch in one inch increments.

The factory default is Disable.

#### **Truncate Alpha**

(From page 78.) 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.

The factory default is Enable.

#### Twinax Type

(From page 77) This parameter defines the printer emulation as follows:

- 5225
- 4234

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

The factory default is 4234-2.

#### Typeface

(From page 78.)

- Letter Gothic. Letter Gothic is a non-proportional font where all of the characters take up the same amount of space when printed.
- **Courier**. Courier is a non-proportional (monospaced) font where all characters take up the same amount of space when printed.
- OCR-A / OCR-B. Optical character recognition fonts printing at 120 dpi horizontally and 144 dpi vertically. Both fonts print only at 10 cpi.

The factory default is Letter Gothic.

#### **Uniform Fonts**

(From page 78.)

- **Disable.** The typeface selected while in Extended Graphics Mode will be cancelled when the graphics pass is complete.
- **Enable.** The typeface selected while in Extended Graphics Mode will also be used in Standard Graphics Mode and Normal Mode.

The factory default is Disable.

#### **UPC Descenders (IGP)**

(From page 78.) This parameter allows you to print bar code descenders when human readable data is not presented in the UPC/EAN bar codes.

- **Always**. UPC/EAN bar codes are printed with descenders, even if there is no human readable data.
- **Never**. UPC/EAN bar codes are printed without descenders if there is no human readable data.
- **Only with PDF.** UPC/EAN bar codes are printed with descenders only when the PDF command is presented.

The factory default is Always.

#### **UPC Descenders (Code V)**

(From page 78.)

- **Enable.** UPC/EAN bar codes are printed with descenders, even if there is no human readable data.
- **Disable.** UPC/EAN bar codes are printed without descenders if there is no human readable data.

The factory default is Enable.

#### **Upr. Case Select**

(From page 79.) Controls how the printer handles lowercase characters it receives from the host computer. When enabled, all characters will be printed in uppercase.

- **Disable**. Prints lowercase characters received from the host computer as lowercase, and 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 are printed as uppercase.

The factory default is Disable.

#### Var Ratio Barcd

(From page 78.)

- Low Resolution. The default. Sets dot values to be interpreted as 60 dpi P-Series dots.
- High Resolution. Sets dot values to be interpreted as print engine dots.

The factory default is Low Resolution.

#### **Vertical DPI**

(From page 78.) This feature enables the thermal printer to print images as close as possible to the same size as those originally programmed for a line matrix or laser printer by selecting a vertical resolution that matches that of the printer that the file was originally generated for.

Although the range allows a selection of up to 400 dpi, the thermal printer is capable of printing up to 203 (4400-004, 4400-006, 4400-008) and 300 (4400-004, 4400-006, 4400-008) dpi vertical resolution.

The factory default is 72.

#### Width Limit

(From page 78.) When enabled, the system will limit the length and width for expanded characters to a limit shown in Table 3, which shows the maximum width allowed for a specific height in the range of 00 through 40 (0.0 through 4.0 inches).

The factory default is Disable.

Height Param.	Max. Width Allowed	Height Param.	Max. Width Allowed
00	99	21	51
01	99	22	53
02	3	23	56
03	6	24	58
04	8	25	61
05	11	26	63
06	13	27	66
07	16	28	68
08	18	29	71
09	21	30	73
10	23	31	76
11	26	32	78
12	28	33	81
13	31	34	83
14	33	35	86
15	36	36	88
16	38	37	91
17	41	38	93
18	43	39	96
19	46	40	98
20	48		

Table 3. Width Limit Table

## **Diagnostics Functions**

#### Introduction

The Diagnostics top-level menu contains several functions which enable the user to test and diagnose the operation of the printer. There are also several menu items which display various printer operating statistics, and allow the error log and accumulated printhead data to be cleared.

#### **Diagnostics Menu Items**

The following list describes all menu items in the Diagnostic Functions toplevel menu.

#### **Clear Error Log**

(From page 80.) Clears entries in the error log.

#### **Head On Time**

(From page 80.) Displays the time that power has been applied to the printhead since the last Reset Head Data operation. This value is set to zero at the factory after burn-in testing.

#### Head Prt Dist

(From page 80.) Displays the length of media actually printed since the last Reset Head Data operation. This value is set to zero at the factory after burnin testing.

#### Head Type

(From page 80.) Displays the printhead dot density.

#### **Head Voltage**

(From page 80.) Displays the applied printhead voltage.

#### Hex Dump Mode

(From page 80.) When enabled the printer prints out data sent from the host in hexadecimal format.

The factory default is Disable.

#### Print Error Log

(From page 80.) Prints the current log of errors. Most non-routine faults (RIBBON FAULT, PRINT HEAD HOT) are stored in the error log.

#### **Printer Tests**

(From page 80.) This menu item selects the test pattern to be printed. These patterns are typically used to check the print quality and operation of the printer. The following tests can be selected.

- **Checkerboard.** This pattern helps identify marginal printhead elements, quality of edge sharpness, and uneven print quality.
- **Grey.** This pattern helps identify burned out printhead elements and uneven print quality.
- Grid. This pattern helps identify edge sharpness and uneven print quality.
- **Current Config.** Prints the current printer configuration and helps identify the text print quality.
- Left Test. This pattern contains a series of ladder-type bar code symbols. The first prints four ladder symbols and the last prints a single ladder symbol. This pattern helps to identify ribbon wrinkle problems.
- **Right Test.** This pattern contains a series of ladder-type bar code symbols, starting with four, and decrementing by one symbol on each print until a single symbol prints. This pattern helps to identify ribbon wrinkle problems.
- E-net Test Page. Prints the Ethernet statistics stored on the Ethernet Interface adapter. This menu item appears only if the Ethernet Interface adapter is installed.

Once the desired test pattern has been selected, printing is initiated by pressing the  $\downarrow$  key. In the case of the Checkerboard, Grey and Grid test patterns, the number of times the pattern will be repeated is determined by the setting of the Test Count menu item. If the Test Count menu item is set at Continuous, printing is stopped by pressing the  $\downarrow$  key again.

#### Ptr On Time

(From page 80.) Displays the cumulative time in hours the printer has been powered on.

This value is set to zero at the factory after burn-in testing.

#### **Ptr Print Dist**

(From page 80.) Displays the cumulative number of inches the printer has moved.

This value is set to zero at the factory after burn-in testing.

#### **Reset Head Data**

(From page 80.) Resets all printhead statistics values (Head Prt Dist and Head On Time) to zero.

#### **System Memory**

(From page 80.) Displays the amount of DRAM installed.

#### **Test Count**

(From page 80.) This menu item selects the number of times the selected test pattern will be printed.

The factory default is Continuous.

## **Parallel Port Functions**

#### Introduction

This main menu item contains several functions which enable the user to configure the printer parallel port to match the characteristics of a specific host parallel interface.

#### Parallel Port Menu Items\*

The following list describes all menu items in the Parallel Port Functions toplevel menu.

**NOTE:** Please note that the asterisked items do not appear in the menu after an ONLINE/OFFLINE sequence if the IEEE 1284 Port Type has been selected.

#### Buffer Size in K\*

(From page 80.) This option configures the amount of memory allocated for the Ethernet buffer. You can specify between 1 and 16 Kbytes, in 1-Kbyte increments.

#### Busy on Strobe\*

(From page 80.)

- Enable. Asserts a busy signal after each character is received.
- **Disable**. Asserts a busy signal only when the print buffers are full.

The factory default is Enable.

#### Data Bit 8\*

(From page 80.)

- Enable. 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, data bit 8 internally indicates PI line status. To use the PI line, disable data bit 8, and enable the Host PI configuration option (under the PI Control option, below).
- **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.

The factory default is Enable.

#### **Data Polarity**

(From page 80.) The Data Polarity parameter must be set to match the data polarity of your host computer.

- Standard. Does not expect the host computer to invert the data.
- **Inverted**. Expects the data received on the data lines from the host computer to be inverted. Ones become zeros, and vice versa.

The factory default is Standard.

#### Latch Data On

(From page 80.) Specifies whether the data is read on the leading or trailing edge of the data strobe signal.

The factory default is Leading.

#### **PI Ignored**

(From page 80.) The PI (Paper Instruction) signal is used to control vertical paper motion.

- **Enable**. Ignores the PI signal and treats 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.

The factory default is Enable.

#### Port Type (Parallel)

(From page 80.) This menu items selects the type of printer parallel port interface to be used with its host. The parallel port can also be disabled. The factory default is Centronics.

#### **Prime Signal**

(From page 80.)

- **Enable**. The parallel port will perform a warm start (reboot) if the host asserts the Prime Signal.
- **Disable**. The parallel port will not perform a warm start (reboot) if the host asserts the Prime Signal.

The factory default is Disable.

#### **Report Status**

(From page 80.)

- **Disable**. When a fault occurs on the printer, only the active port reports the fault to the host.
- **Enable**. The port will report any fault even when it is not the current active port.

The factory default is Disable.

#### Resp. Polarity\*

(From page 80.) The Response Polarity parameter must be set to match the response polarity of your host computer.

- **Standard**. Does not invert the response signal.
- Inverted. Inverts the response signal sent to the host computer.

The factory default is Standard.

#### **Serial Port Functions**

#### Introduction

This main menu item contains several functions which enable the user to configure the printer serial port to match the characteristics of a specific host serial interface.

#### **Serial Port Menu Items**

The following list describes all menu items in the Serial Port Functions toplevel menu.

#### **Baud Rate**

(From page 80.) 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. The choices for the RS-232 and RS-422 interfaces are 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 Baud.

**NOTE:** If you select a baud rate that is greater than 19200, you may need to use RS-422 to prevent data loss. You also may need to increase the Buffer Size in K parameter from the default (1 Kbyte) to improve performance.

The factory default is 9600.

#### **Buffer Size in K**

(From page 80.) This option configures the amount of memory allocated for the serial port buffer. You may specify between 1 and 16 Kbytes, in 1-Kbyte increments.

**NOTE:** If you select a baud rate that is 19200 or greater, you may need to increase the Buffer Size in K parameter from the default to 16 Kbytes to improve performance.

The factory default is 1.

#### **Data Protocol**

(From page 80.) You can select one of the following serial interface protocols to meet the host interface requirements.

- XON / XOFF. The printer controls the flow of communication from the host by turning the transmission on and off. In some situations, such as when the buffer is full or the timing of signals is too slow or too fast, the printer will tell the host to stop transmission by sending an XOFF character. An XOFF character is sent when the number of empty bytes in the buffer is less than or equal to 25 percent of the buffer size. If the host keeps sending data after an XOFF is sent, the printer firmware will continue to send an XOFF for every 16 characters received. When cleared, the printer will resume receiving data (XON). The data does not have any End of Text codes; XON / XOFF is a non-block 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 the ETX, thereby acknowledging it has received the entire block of data.
- ACK / NAK. ACK means acknowledge; the device acknowledges it has accepted a transmission. NAK means negative acknowledge; the device did not receive the transmission.

Series 1 char. The printer controls the flow of communication from the host by turning the transmission on and off using response characters sent to the host. If the number of valid bytes in the buffer reaches 75 percent of the buffer size, the online or offline and buffer full response character is sent. If the buffer is completely full, an online or offline buffer full response is sent every time a character is sent from the host. Whenever the printer state changes to online or offline, the appropriate response character is sent. If the idle response option is enabled, the printer will send a response character every two seconds while the number of valid bytes in the buffer is less than 75 percent of the buffer size. If a poll character is received (configurable from the Poll Character xx Hex option on the front panel from 0 through FF hex), the printer will send a response character *n* milliseconds later (configurable from the Poll Character xx MS on the front panel from 0 through 30). This n milliseconds is called the poll delay. The poll character will be removed from the input data stream and will not be processed. This may cause problems with the transmission of binary data (e.g. control codes, bit image, etc.). If a poll delay is started due to the receipt of a poll character and another poll character is received, the second poll character has no effect, and is removed from the input data stream. If a transition (from buffer full to empty or online to offline) occurs during a poll delay, the new printer state will be sent at the end of the poll delay. The response characters are described below.

Printer State	Response
Online and Buffer Empty	CR
Online and Buffer Full	3
Offline and Buffer Empty	0
Offline and Buffer Full	2

The factory default is XON/XOFF.

• Series 1 2 char. This protocol behaves exactly the same as the Series 1 Char except there is a two-character response to the host. The response characters are described in the following table:

Printer State	Response
Online and Buffer Empty	1 CR
Online and Buffer Full	3 CR
Offline and Buffer Empty	0 CR
Offline and Buffer Full	2 CR

• **DTR.** The printer controls the data flow by sending 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.) DTR is not available when RS-422 is selected.

#### **Data Term Ready**

(From page 80.) Stands for 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 if the printer is ready to receive data.

- True. Continuously asserts the DTR signal.
- **On-Line and BNF (buffer not full)**. Asserts the DTR signal when the printer is online and the internal serial buffer is not full.
- Off-Line or BF (buffer full). Asserts the DTR signal when the printer is offline or the internal serial buffer is full.
- **On-Line**. Asserts the DTR signal when the printer is online.
- **False**. Never asserts the DTR signal.

The factory default is True.

#### **Idle Response**

(From page 80.) This option is for the Series1 protocol. When enabled, the printer will send a response character every two seconds while the number of valid bytes in the buffer is less than 75 percent of the buffer size.

The factory default is Disable.

#### **One Char Enquiry**

(From page 80.) The One Char Enquiry mode uses the Poll Character to detect a request from the host and sends a response back to the host. This option also allows you to turn on and off this feature.

Table 4. One Char Enquiry Response Characters

Printer State	Response (hex)
Online and Buffer Not Full	20
Online and Buffer Full	21
Offline and Buffer Not Full	22
Offline and Buffer Full	23

The Poll Character is removed from the data stream. If the Data Protocol is set to ETX/ACK, ACK/NAK, or Series 1, One Char Enquiry is automatically disabled.

The factory default is Disable.

#### Parity

(From page 80.) Set for odd parity, even parity, mark, sense, or no parity. The setting must match the corresponding parity setting in the host computer.

The factory default is None.

#### **Poll Character**

(From page 80.) This option is for the Series1 protocol. Whenever the printer receives this character, it sends a response to the host indicating the current state of the printer (see Series1 protocol). It may be configured from 0 through FF hexadecimal.

The factory default is 00 Hex.

#### Poll Response

(From page 80.) This option is for the Series1 protocol. After receiving a poll character, the printer will wait the poll response time in milliseconds before sending the response. It may be configured from 0 through 30.

The factory default is 0 msec.

#### Port Type (Serial)

(From page 80.) This menu item selects the type of printer serial port interface, RS 232 or RS 422, to be used with its host. The serial port can also be disabled.

The factory default is RS 232.

#### **Printer Status**

(From page 80.) Disabled - Printer status ignored. The factory default is Disable.

#### **Report Status**

(From page 80.) When a fault condition occurs in the printer, normally only the active port reports the fault to the host. With this menu item enabled, the port will report any fault even when it is not the current, active port.

The factory default is Disable.

#### **Request to Send**

(From page 80.) 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.

- **On-Line and BNF**. Asserts the RTS signal when the printer is online and the internal serial buffer is not full.
- **Off-Line or BF**. Asserts the RTS signal when the printer is offline or the internal serial buffer is full.
- **On-Line**. Asserts the RTS signal when the printer is online.
- False. Never asserts the RTS signal.
- True. Continuously asserts the RTS signal.

The factory default is On-Line and BNF.

#### **Stop Bits**

(From page 80.) Sets the number of stop bits in the serial data word. Either one or two stop bits can be selected. The setting must match the corresponding stop bit setting in the host computer.

The factory default is 1.

#### Timeout

(From page 80.) This is the value used by the printer to time out from the current port and check the other selected Port Types for data to print. When the printer has not received data from the host after certain period of time, it needs to Timeout in order to service the other ports.

The factory default is 10 sec.

#### **Trickle Time**

(From page 80.) When the printer is printing data from a host and a second job is received by the printer from a different host, Trickle Time prevents the second host from timing out while it is waiting for its data to be printed. In order to support this feature, the port has to be able to accept data from the host and store it for future use.

For example, if the printer is printing a job from the serial port, and then receives a second print job from the parallel port, the data from the parallel port will "trickle" bit by bit into the printer buffer to prevent a timeout error from being sent back to the host connected to the parallel port.

The selected value is the time that the printer waits before getting the next byte of data from the host. The Trickle Time value should be less than the host time out value, but not too much shorter or else the printer fills up its buffer too fast. This function is not applicable for C/T hotport.

The factory default is 1/4 sec.

#### Word Length

(From page 80.) Sets the length of the serial data word. The length of the data word can be set to 7 or 8 bits, and must match the corresponding data bits setting in the host computer.

The factory default is 8.

## **Optional Ports Functions**

#### Introduction

The Optional Ports Functions allows you to set various operating parameters for the Coax/Twinax and Ethernet Interface host interfaces.

#### **Optional Ports Menu Items**

The following list describes all menu items in the Optional Ports Functions top level menu.

#### **Device Address**

(From page 80.) 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.

The factory default is 1.

#### **Gateway Address**

(From page 81.) This menu item sets the Gateway Address for the TCP/IP protocol. If the Gateway Address is assigned by Bootp, Arp or DHCP, it is dynamic and read-only.

The factory defaults for Gateway Address Seg 1 through Gateway Address Seg 4 are 255, 255, 255 and 255 respectively.

#### **Image Buf Size**

(From page 80.) Allows you to select 4K or 2K as the image buffer size. This option is only valid when printer emulates 3287. For the 4234 emulation, the buffer size is fixed at 4K. A POR status is sent to the host when the printer is put online.

The factory default is 4K.

#### **IP Address**

(From page 81.) This menu item sets the IP Address for the TCP/IP protocol. If the Gateway Address is assigned by Bootp, Arp or DHCP, it is dynamic and read-only.

#### **MAC Address**

(From page 81.) This menu item is the Manufacturer's Assigned Number, and is unique for each printer. It is read-only.

#### **NetBIOS Protocol**

(From page 81.) When disabled, the Ethernet Interface does not recognize the NetBIOS protocol. If enabled, the Ethernet Interface will respond to the NetBIOS protocol.

The factory default is Enable.

#### **Novell Frame**

(From page 81.) This menu option provides selection of the frame type for the Novell protocol. For the definition of each frame type, refer to the appropriate Novell-authorized documents.

The factory default is Auto Sensing.

#### **Novell Protocol**

(From page 81.) When disabled, the Ethernet Interface does not recognize the Novell protocol. If enabled, the Ethernet Interface will respond to the Novell protocol.

The factory default is Enable.

#### Port Type (Coax/Twinax)

(From page 80.) This menu items selects desired active CTHI interface, and appears only when the CTHI option is installed.

The factory default is Twinax.

#### PMU Port Number

(From page 81.) When IBM Printer Management Utility (PMU) software communicates with the printer through the Ethernet Interface, it opens a socket with a specified port number. If this port number is changed, the user is responsible for insuring that the PMU uses the same port number to communicate with the printer.

The factory default is 3001.

#### **PMU Port Timeout**

(From page 81.) This menu item selection is used by the Network Interface Card (NIC) when the NIC's host buffer is full and the PMU has not communicated with the printer within the specified time period. Then the NIC times out on the PMU data port, the data in the buffer will be discarded. If a heavy traffic situation is normally encountered, it is recommended that the PMU Port Timeout value be increased.

The factory default is 100 seconds.

#### **Report Status**

(From page 80.) When a fault condition occurs in the printer, normally only the active port reports the fault to the host. With this menu item enabled, the port will report any fault even when it is not the current, active port.

The factory default is Disable.

#### Subnet Mask

(From page 81.) This menu item sets the Subnet Mask for the TCP/IP protocol. If the Subnet Mask is assigned by Bootp, Arp or DHCP, it is dynamic and read-only.

The factory defaults for the Subnet Mask Seg 1 through Subnet Mask Seg 4 are 255, 255, 255 and 255 respectively.

**NOTE:** When changing any of the ETHERNET PARAMS menu items, IP ADDRESS, GATEWAY ADDRESS or SUBNET MASK, the printer will reset the NIC when the printer is placed on-line. When the printer resets the NIC, the LCD displays E-NET RESET. After the NIC has completed its initialization, the LCD displays E-NET INIT to signal that the NIC and printer are in the initialization process. When both NIC and printer have completed initialization, the LCD displays E-NET READY.

#### Timeout

(From page 80.) This menu item allows the user to set the time that, when the printer has not received data from its host, it will begin to service all other host ports looking for data to print.

The factory default is 10 sec.

## **Downloading True Type Fonts**

There are several ways to download TrueType fonts to your printer.

#### **IBM Windows Driver**

Load the IBM Windows driver (provided with the printer on the Software Starter kit CD). Follow the instructions within the driver to download and access TrueType fonts.

#### Font Download Utility

The Software Starter Kit CD also contains a stand alone Font Download Utility which from a Windows based system will allow you to download the fonts. A parallel I/O connection is assumed.

#### Create and Send Download File - Online (IGP only)

A TrueType font can be converted to a downloadable form by appending a header to the file as described in the *IGP Programmer's Reference Manual*, Font Load command. After conversion, the file can be copied to the appropriate IO port of the printer while it is online, just like any other print file (for example: copy/b filename.ext lpt1).

#### Create and Send Download File - Download Mode

Create download file as described above. Power up the printer as described in steps 9 and 10 following under "downloading Optional Font Files to Flash Memory." Substitute the name of the file you just created for "FILENAME.DWN."

#### **Using Downloaded True Type Fonts**

If downloaded from the IBM Windows driver, TrueType fonts can be accessed by any program using the driver as native fonts. Many WSYWIG bar code labelling application programs also provide the utility to download and access TrueType fonts as printer resident (as opposed to bitmapped images). Otherwise, use the FONT command as described in the *IGP Programmer's Reference Manual* to access the downloaded fonts.

## Chapter 3 Printer Configuration Menu Items

# 4 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. Plus, with the Auto Switching feature, you can configure the printer to accept several interfaces at the same time.

## **Auto Switching**

This feature gives the printer the ability to handle multiple data streams sequentially. With Auto Switching, the printer can service hosts attached to the serial, parallel, coax and twinax ports as if they were the only interface connected.

For example, if the host computer sends one print job to the RS-232 serial port and a separate print job to the IEEE 1284 parallel port, the printer's Auto Switching is able to handle both jobs, in the order they were received, without the user having to reconfigure the selected interface between jobs.

This chapter describes the interfaces provided with the printer.

#### **Standard Host Interfaces:**

- Centronics parallel
- IEEE 1284 parallel bidirectional
- High Speed Serial Port (RS-232/RS-422)

#### **Optional Host Interfaces:**

- Coax / Twinax
- Ethernet 10/100Base-T

In addition to descriptions for the multi-line interfaces, this chapter also provides instructions for configuration of terminating resistors for the parallel interfaces.

## **Centronics Parallel Interface**

The length of the data cable from the host computer to the printer must not exceed 15 feet (5 meters).

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 Return	13 28	GROUND	30
DATA LINE 3 Return	4 22	FAULT Return	32 29	Spares	14
DATA LINE 4 Return	5 23	PAPER EMPTY Return	12 28	No Connection	34,35, 36
DATA LINE 5 Return	6 24	BUSY Return	11 29	+5 Volts	18
DATA LINE 6 Return	7 25				
DATA LINE 7 Return	8 26				
DATA LINE 8 Return	9 27				
DATA STROBE Return	1 19				
PAPER INSTRUCTION Return	15 29				
PRIME Return	31 30				

 Table 5. Centronics Interface Connector Pin Assignments

## **Centronics Parallel Interface Signals**

Signals	Purpose
Data Lines 1 through 8	Provide 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 Parallel submenu.
Data Strobe	Carries a low true, 100 ns minimum pulse from the host that clocks data into the printer.
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	A high true level from the printer to indicate the printer is ready for data transfer and the PAUSE key on the control panel has been activated. When the printer is in online 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.
Prime	A high true level from the host to indicate the printer should perform a warm start (printer is reset to the power-up configuration values).
Paper Instruction (PI)	Carries a VFU signal from the host with the same timing and polarity as the data line.
Fault	A low true level from the printer indicates a printer fault.

#### Table 6. Centronix Parallel Interface Signals

## **IEEE 1284 Parallel Interface**

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

## **Compatibility Mode**

This mode provides compatibility with Centronics-like host I/O (see Table 5). 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 IEEE 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.

## Signals

Table 7 lists each of the signals associated with the corresponding pins on the IEEE 1284 interface. Descriptions of the signals follow.

Din	Source of Data	Type of Mode				
PIN	Source of Data	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		
14	Host	nAutoFd	Host Busy	HostAck		
15		Not Defined				
16		Logic Grid				
17		Chassis Grid				
18	Printer	Peripheral Logi	c 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)				

Table 7. IEEE 1284 Signals

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

Table 7	IEEE	1284	Signals
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**NOTE:** The length of the data cable from the host computer to the printer should not exceed 10 meters (32 feet).

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

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

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

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

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

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

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

**Peripheral Logic High.** Driven by the printer. When 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 terminating resistors that are used for parallel interface configurations suitable for most applications. These 470 ohm pull-up and 1K ohm pull-down terminating resistors are located at RP2 and RP1 on the Controller PCBA.

If the values of these terminating resistors are not compatible with the particular interface driver requirements of your host computer, you must call your printer service representative to have this situation addressed.

## **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 length of the data cable from the host computer to the printer must not exceed 50 feet (15 meters) for RS-232 or 4000 feet (1220 meters) for RS-422. (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.

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

Table 8. RS-232 Serial Interface Connector Pin Assignments

**RS-232** 

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

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

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

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

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

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

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

**КЭ-23** 

## **RS-422**

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

#### Table 9. RS-422 Serial Interface Connector Pin Assignments

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

**+TD**, **-TD**—Differentially driven serial data stream for transmitting status and control information to the host. Subject to protocol selection.

**NOTE:**  $\pm$ **RD** and  $\pm$ **TD** form signal and return paths of a differential line signal.

Chapter	4	Interfaces

5

## Diagnostics and Troubleshooting

## **Requesting IBM Service**

Follow the actions in the troubleshooting tables in this chapter. Most problems can be easily resolved using these tables. If you are unable to resolve the problem, you may want to request service from your IBM service team. To request service on your IBM 4400 Series Thermal Printer in the U.S. or Canada, call 1-800-358-6661. Service is available from 8 a.m. to 8 p.m. eastern time. To request service in other countries, call your countryCall Center.

You may call for service free of charge during the printer's warranty period. You can obtain service after the warranty period has expired if you sign a service contract agreement with an authorized service provider.

You also can obtain service on a billable-per-call basis after the warranty period has expired. Please have your service contract information and printer serial number available when you call. The four digit machine type is 4400. Please enter this number when prompted.

**NOTE:** Technical support is also available from the IBM Printing Systems Division home page at: http://www.printers.ibm.com

## **Printer Self-Test**

A sequence of automatic tests is performed during printer power-up. If any faults are detected at that time, an error message will display (see page 191).

Printer operation should also be verified before setting the printer for online operation. This is done by running the printer internal self-test diagnostic program, which will produce a selection of printed test labels. For more details, see page 151.

The Test Print program can be enabled from the printer through the TEST PRINT key or from the DIAGNOSTICS menu and provides the capability for printing a variety of test pattern labels.

**NOTE:** Before attempting to print test labels, the printer must be properly setup for the type of media installed. (See the MEDIA CONTROL menu selections on "Menu Options" on page 76.).

#### **Printing Test Labels**

The printer has a built-in function that prints a selected number of test labels or test patterns. The patterns are useful for isolating printer faults and checking print quality. For an explanation of the different test patterns and how they are used, see See "Printer Tests" on page 151.

## **Troubleshooting Common Situations**

Occasionally, situations occur that require some troubleshooting skill. Possible problem situations and potential solutions are listed in this section. While not every conceivable situation is addressed here, you may find some of these tips helpful. Contact a qualified service technician for problems that persist or are not covered in this section.

## **Improving Processing Time**

Before looking at solutions for decreasing processing time and increasing throughput, it may help to understand what happens during processing. When the printer receives a format command, it enters the label formatting mode. Label formatting requires time to process the label data into the printer buffers.

The time required varies, depending on the complexity of the label format and on the size of the area being printed. Once the data has been mapped into memory, the printer will start printing as many labels as requested by the quantity command. In most cases, there is no delay between labels; however, there are certain situations that may cause delays between label printing:

 Using Automatic Label Peel-Off or Tear-Off media handling The printer stops between each label and waits for the label to be removed.

## Data Exchange

Many things can cause data loss or communications problems. This section suggests some ways to isolate these problems and determine their cause.

## Handshaking

Handshaking is the exchange of signals between two computers (or a computer and a peripheral input or output device) to indicate the status of the data being transferred. In the serial mode, the printer uses both hardware and software handshaking and transmits both forms simultaneously when the input buffer is full.

The printer can be used with either serial or parallel host interfaces. Parallel interfaces are usually straightforward, with no special settings required. Serial interfaces, however, have a variety of possible communication parameter settings. The two methods of handshaking that can be used, hardware and software, are explained below.

#### Hardware Handshaking

This electrical signal is controlled by the logic state on pin 20 of the serial interface connector J2 (at the back of the printer). The signal will go high when the printer is ready to receive data. The signal will go low when the printer is in the busy state, which indicates that the printer input buffer is full and can no longer receive data.

#### • Software Handshaking

XON and XOFF are software signals that control serial data flow between the printer and the host system. When the printer input buffer is full, the printer transmits an XOFF (CTRL S) character that signals the host to stop sending data. When memory space becomes available in the input buffer, the printer sends an XON (CTRL Q) character, which tells the host that the printer is ready to receive more data.

If the printer appears to have communication problems, the self-test configuration test labels (see page 151) and character hex dump modes (see page 150) should be checked. The tests can help identify printer configuration errors that can cause problems.

Both of these test procedures are covered in this chapter. Configuration items to check include the following:

- Check that the data string being sent to the printer contains the correct information.
- Verify that the correct host interface port is being used and that the communication parameters match those of the host (i.e., baud rate, parity, etc.).
- Verify that the correct interface cable is installed between the host and the printer.

#### Interfacing

The printer will not function properly with an incorrectly wired cable or the wrong interface cable installed. If the cable is suspect, contact IBM or your authorized service representative.

When the printer is first powered up, it will reset itself to the communication default parameters. The parameters are listed in the following table:

PARAMETER	DEFAULT VALUE
Baud	9600
Data Bits	8
Parity	NONE
Stop Bits	1

The printer interface configuration settings may be entered from the control panel (See Chapter 3, "Configuring the Printer" for complete instructions.)

## **Controlling Print Quality**

Two factors have the greatest effect on print quality:

- The amount of heat applied by the printhead (print intensity)
- The speed at which media is moving under the printhead (print speed)

For example, low-cost direct thermal media often have very high reaction temperatures, which means that it takes a great deal of heat to make a clear image. Resin ribbons and film media may require higher print intensity for a quality image.

The printer provides two ways to increase the heat:

- Running the printer slower by changing the print speed via the host or the MEDIA CONTROL menu.
- Setting the print intensity to a higher value with the Print Intensity function, accessed via the host or through the MEDIA CONTROL menu. This causes more heat to be transferred into the media, thereby generating a darker image.

Also, the printhead should be cleaned frequently to ensure that foreign material does not accumulate on the printhead and interfere with heat transfer. If smears, voids or white lines appear in the printhe form, the printhead should be cleaned with a printhead cleaning pen (see Figure 6).

The cleaning should be done as a matter of routine whenever you install a new ribbon (thermal transfer mode) or when you install new media (direct thermal mode).



Figure 6. Cleaning the Printhead

## **Determining Printhead Wear**

When a printhead is worn, the most common sign of wear are fixed vertical streaks that are always the same size and in the same place on the printout. To determine if the cause of these vertical streaks is a worn printhead, follow these methods.

- 1. Clean the printhead thoroughly with the printhead cleaning pen. Test again for vertical streaks.
- 2. Remove the printhead (see page 181) and examine it for contamination or damage such as scratches, dents, or other marks on the light brown area containing the heating elements. Clean and install it, then test again for vertical streaks.
- 3. Load an alternate roll of media. Test again for vertical streaks.
- 4. Load an alternate roll of ribbon. Test again for vertical streaks.

If after performing all these tests you still see fixed vertical streaks, you must replace the printhead.

You can order new printheads and other consumables directly from IBM. See "Thermal Consumables" on page 19.
# **Replacing The Printhead**

## **Prepare the Printer**

1. Set the printer power switch to O (off).



<3> Hazardous voltages are present in the printer with the power cord connected to the power source. Switch off printer power and unplug the printer power cord before proceeding.

- 2. Unplug the printer power cord from the printer or the AC power source.
- 3. Remove the ribbon and print media.

#### **Replace the Printhead**

#### ATTENTION

Oils from your hands can damage the light brown area (heating elements) of the printhead. Do not touch the light brown area when you handle the printhead.

1. Open the pivoting deck by rotating the deck lock lever clockwise to the end of its travel. The pivoting deck will swing upward, exposing the bottom of the printhead assembly. (See Figure 7.)



#### Legend:

- 1) Deck Lock Lever
- 2) Pivoting Deck
- 3) Printhead Assembly

Figure 7. Opening the Pivoting Deck

#### ATTENTION

#### To prevent electrostatic damage to electronic components, ground yourself by touching an unpainted part of the printer frame before handling and installing the printhead.

- 2. Touch an unpainted part of the printer frame before touching the printhead.
- 3. Behind the pivoting deck, gently push the lower arms of the retainer clips upward to release printhead. You only need to push the clips a small amount to release the printhead. (See Figure 8.)
- 4. Hold the printhead by the black plastic cover as it drops down.
- 5. Push the release tab down and pull the power supply cable out of the printhead assembly.
- 6. Use the pull-tab to disconnect the printhead/controller cable from the printhead assembly.
- 7. Unwrap the new printhead.
- Position the new printhead below the pivoting deck and install the power supply and printhead/controller cable assemblies to the printhead assembly.
- 9. Slide the printhead upward into the pivoting deck until the retainer clips catch it and it snaps into place. You can push the printhead retainer clips up slightly to help engage the printhead.



Figure 8. Replacing the Printhead

#### **Restore the Printer to Operation**

- 1. Inspect the light brown area of the printhead for smudges or fingerprints. If necessary, gently clean the light brown area with a soft, lint-free cloth or a cotton swab moistened with isopropyl alcohol or a Cleaning Pen.
- 2. Install the ribbon and print media.
- 3. Close the pivoting deck and rotate the deck lock lever fully counterclockwise. (See Figure 7.)
- 4. Close the media cover.
- 5. Plug the AC power cord into the printer and the power source.
- 6. Set the printer power switch to | (on).
- Test printer operation and check print quality by selecting the Diagnostics → Printer Tests menu and printing one of the test patterns. (Refer to page 151.)

# **Other Printer Problems**

Symptom	Solution
Communications Failures.	1. Check the interface cable.
	2. Check the configuration to ensure the proper attachment is enabled.
	Control Panel
LCD message display is	1. Verify that the labels are the correct type (direct thermal).
illuminated and the printer appears to be working, but pothing is printed	2. Check that the media is loaded with the direct thermal side facing up.
	3. Check that the transfer ribbon is correctly routed. Route transfer ribbon with ink side out.
	<ol> <li>Check that the printhead assembly is properly closed by pressing down on both sides of the pivoting deck. Make sure the latches on each side of the pivoting deck are locked.</li> </ol>
	<ol> <li>Verify that the ribbon and media are compatible; incompatibility can cause extremely light printing. Match the ribbon to the type of media being used.</li> </ol>
	<ol><li>Check that the Print Intensity is correct. Set the Print Intensity in the Media Control menu.</li></ol>
	<ol> <li>Check that the Label Width parameter value does not exceed the width of the media installed. Set the Label Width in the Media Control menu.</li> </ol>
	8. Remove the printhead completely and re-install it ensuring the cables are correctly seated.
ONLINE status indicator is flashing.	<ol> <li>Check for Out-of-Media condition or missing labels in the middle of a roll. Load correct media.</li> </ol>
	<ol> <li>Check that the ribbon and label stock are correctly routed. Load ribbon and label stock correctly.</li> </ol>
	<ol> <li>Make sure the Print Mode settings (Direct or Transfer) are correctly selected in the Media Control menu.</li> </ol>

Symptom Solution	
	Power Failures
Printer fails to turn on, the display is not backlit, and the	1. Check that printer AC power cord is correctly attached to the printer and to the AC power outlet.
fan is not running.	<ol> <li>Have a qualified electrician test AC wall outlet for correct power range. Locate printer in an area that has correct power range.</li> </ol>
	<ol><li>Check the AC power cord. Replace a damaged AC power cord or one that you suspect may be bad.</li></ol>
	4. Call your authorized service representative.
	Print Quality
Media moves, but no image prints in ONLINE mode.	<ol> <li>Make sure the J402 power supply cable has a good connection to the right side of the printhead.</li> </ol>
	2. Place the printer offline and print the Checkerboard diagnostic test pattern (see page 151). If the pattern prints, there is a communication problem between host computer and the printer.
Media moves, but no image prints in Direct Thermal	<ol> <li>Media is not the type for Direct Thermal printing. Install Direct Thermal media.</li> </ol>
mode.	<ol> <li>Direct Thermal media is installed wrong side up. Reinstall media.</li> </ol>
Media and ribbon move, but no image prints in Thermal Transfer mode.	<ol> <li>Print the checkerboard diagnostic test pattern and check if the image appears on used portion of ribbon. If image is on ribbon, ribbon may be installed with the ink side against the printhead, instead of against the media.</li> </ol>
	2. The ribbon may be designed for another model printer.
	3. The ribbon may not be compatible with the media.
When narrow media is installed, the media moves but no image prints.	Verify the Label Width value in the Media Control menu agrees with the width of the installed media. Too large a value will start the image too far to the right and off the media.
Printing is faded or poor	1. Clean the printhead.
quality.	2. Check that the pivoting deck is closed and latched. Close the printhead by pressing down on both sides of the pivoting deck and rotating the deck lock lever fully counterclockwise.
	3. Verify that the head pressure adjustment dial is properly set. Try increasing the pressure.
	4. Verify that the Media Control menu Print Speed and Print Intensity values are correct. Adjust Print Speed and Intensity in the Media Control menu or via host software.

Symptom	Solution
Print is light on left or right side of label.	Check to see if the pressure blocks are set for the width of the media being used. Set each block near the edge of the media.
Prints strange characters instead of the correct label format.	1. If the printer serial interface is being used, check that the printer serial baud rate setting matches the baud rate of the host computer. Reset the printer via software, or turn the printer off and then on.
	2. Check if the printer serial host interface is set for 8 data bits but the transmitting device is set for 7 data bits (or vice-versa). Check the current setting by viewing it on the LCD and use the Serial Port menu to adjust the settings if necessary.
	3. If the printer parallel interface is being used, make sure the parallel interface terminating resistors are correct for the host computer drivers.
Smears or voids in printed	1. Clean the printhead.
image.	2. Make sure the printhead temperature (Print Intensity) is not too high. Change the Print Intensity value in the Media Control menu. (See "Print Intensity" on page 98.)
	3. Check that the media has not been mishandled before or during installation in the printer. Soiled media or media with fingerprints will prevent proper ribbon transfer.
	<ol> <li>Check that media has not been installed inside out. Surfaces on both sides may look identical, but can produce big differences in print quality.</li> </ol>
	<ol><li>Make sure the correct ribbon and media combination are being used. Use the correct ribbon type.</li></ol>
	<ol> <li>Check the ribbon for creases or folds across its surface. Smooth out the ribbon to remove any creases.</li> </ol>
	<ol> <li>Reduce the Print Speed value through the Media Control menu or via host software.</li> </ol>

Symptom	Solution
	Printer Operation
Advances several labels when FEED key is pressed.	<ol> <li>Check that labels are loaded correctly. (See "Loading Media and Ribbon" on page 36.)</li> </ol>
	2. Check that the Page Length selected under the Media Control menu or the Page Length software command sent by the host computer agrees with the length of the media installed. (Even though transmissive or reflective forms are used to establish top-of-form position, a larger page length will override the gap if Clip Page is set to disable in the Media Control menu and skip a page or pages.) In the Media Control menu, set the Page Length to match the media being used.
	<ol> <li>Check that the printer is optimized to detect the type of media installed. Perform the Run Calibrate procedure for transmissive and reflective media. (See "Calibrate Procedure" on page 58.)</li> </ol>
	<ol> <li>Adjust the media sensor horizontally to detect the gap, holes, notches, or narrow width black stripe. (See "TOF/ Paper Out Sensor Horizontal Adjustment" on page 56.)</li> </ol>
	<ol> <li>If problem persists, contact your authorized service representative.</li> </ol>
Print quality is good but printer skips every other label.	<ol> <li>Make sure that the label is not formatted too close to the top edge of the form. Leave white space equal to eight dot rows at the top of the label.</li> </ol>
	2. Check whether Clip Page is enabled or disabled in the Media Control menu. Clip Page enabled causes any printable data to be clipped off and lost once the next TOF position (transmissive gap, notch, hole, or reflective strip) is detected. Clip Page disabled allows the printer to ignore a gap or stripe. The printer looks for the gap or stripe after the specified Label Length is first reached.
	Ribbon
Printer advances media, but	1. Make sure the ribbon is installed correctly.
not advance.	<ol> <li>A poor ribbon/media combination can cause insufficient friction between media and ribbon. Verify that the correct ribbon and media are being used.</li> </ol>
	<ol><li>The printhead pressure may not be set high enough. Set the pressure higher.</li></ol>
	4. There may be adhesive on the printhead. Clean the printhead.

Symptom	Solution
Printer cuts (melts) through the transfer ribbon.	<ol> <li>Verify that the printing heat setting (Print Intensity) is set to the proper level. In the Media Control menu, set Print Intensity to correct level.</li> </ol>
	<ol> <li>Verify that Print Mode is set for Transfer and not Direct Thermal. In the Media Control menu, set Print Mode to Transfer.</li> </ol>
Printing stops and ONLINE status indicator flashes.	<ol> <li>Check that the TOF/paper out sensor is clean and undamaged.</li> </ol>
	2. Check that the gap between the bottom of a label and the top of the next label is at least 0.100 inch. Use only labels and tag stock approved for this printer.
	3. Inspect for a jammed label. Remove jammed label.
	4. Check that the transfer ribbon and label stock are routed correctly.
Narrow width ribbon breaks frequently.	The Ribbon Width value in the Media Control menu is set too large, which causes too great a ribbon take-up and ribbon supply torque. Reduce the Ribbon Width value to decrease the torque on the ribbon spindle.
Wide width ribbon does not take up properly. The ribbon moves past the platen assembly.	The Ribbon Width value in the Media Control menu is set too narrow for the ribbon installed. Set the Ribbon Width value to match the width of the ribbon installed. This will increase the torque on the ribbon take-up spindle.

### **Printer Alarms**

The printer has built in alarms that monitor printer status and media stock conditions. Alarm messages display indicating the present status of the printer and media stock levels. The alarms also indicate if the printer electronics detects an error condition.

### **Fault Messages**

If a fault condition occurs in the printer, the status indicator on the control panel flashes on and off and the message display indicates the specific fault. Fault messages are summarized in Table 10.

Displayed faults fall into one of two categories:

- Operator correctable
- Field service required

#### **Operator-Correctable Fault Messages**

For the operator-correctable faults, follow the suggested corrective action under the solution section of the table. After correcting the displayed fault, press the PAUSE key to clear the error message and status indicator and resume printing. If the fault message reappears, power off the printer and wait 15 seconds before powering on the printer again. If the error condition persists, contact your authorized service representative.

#### **Fault Messages Requiring Field Service Attention**

If a fault is not correctable by the operator, the fault message is followed by an asterisk (\*). This usually indicates that an authorized service representative is needed. You should try two steps to clear the fault <u>before</u> calling your authorized service representative:

- 1. Set the printer power switch to O (off), wait 15 seconds, then turn the printer on again. Run your print job again. If the message does not appear, it was a false indication and no further attention is required.
- 2. If the message reappears, press the PAUSE key. If the message goes away, it was a false indication and no further attention is required. If the message reappears, call your authorized service representative.

Displayed Message	Can User Correct?	Explanation	Solution
BAD VFU CHANNEL	Yes	The user tried to use an undefined VFU channel.	Use defined channels.
BUFFER OVERFLOW	Yes	Host sent data after the printer buffer was full. (serial interface)	Make a configuration printout. Verify that the printer matches the host serial interface configuration settings for Data Protocol, Baud Rate, Data Bits, Stop Bits, Parity, Data Terminal Ready, and Request to Send. Set printer serial interface parameters to match those of the host.
BUFFER OVERRUN	Yes	Receive overrun. (serial interface)	<ol> <li>Make a configuration printout. Verify that the printer matches the host serial interface configuration settings for Data Protocol, Baud Rate, Data Bits, Stop Bits, Parity, Data Terminal Ready, and Request to Send.</li> <li>Set the printer serial interface parameter to match those of the host.</li> </ol>
CLEARING PROGRAM FROM FLASH	Yes	Emulation software successfully loaded into printer RAM and the checksum matched. The old program is now being deleted from flash memory.	No action required.
DIAGNOSTICS PASSED	Yes	The printer passed its memory and hardware initialization tests.	No action required.
E-NET INIT	Yes	Ethernet is initializing.	No action required.
E-NET READY	Yes	Ethernet has finished initializing.	No action required.
E-NET RESET	Yes	Ethernet interface is being reset.	No action required.
EC SOFTWARE FAIL See Manual	Yes/No	Engine control software failure.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: DC PROGRAM NOT VALID	Yes/No	The printer cannot find the data controller program or the validation checksum is corrupt.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: DRAM AT ADDRESS XXXXXXXX	Yes/No	The printer found a defective memory location.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: FLASH DID NOT PROGRAM	Yes/No	The printer encountered an error trying to program flash memory.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.

Table 10.	LCD	Message	Troubleshooting
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Displayed Message	Can User Correct?	Explanation	Solution
ERROR: NO DRAM DETECTED	Yes/No	The printer could not find any DRAM.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: PROGRAM NEEDS MORE DRAM	Yes/No	The printer requires more DRAM memory in order to run the downloaded program.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: PROGRAM NEEDS MORE FLASH	Yes/No	The printer requires more flash memory in order to run the downloaded program.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: PROGRAM NOT COMPATIBLE	Yes	The printer is not compatible with the downloaded program.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: PROGRAM NOT VALID	Yes	The printer does not see a program in flash memory.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: SECURITY PAL NOT DETECTED	Yes/No	The security PAL is not present or has failed.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: SHORT AT ADDRESS XXXX	Yes/No	Hardware failure in DRAM or Main PCBA controller circuitry.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: WRITING TO FLASH	Yes/No	Hardware or software fault in flash memory.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR: WRONG CHECKSUM	Yes/No	The printer received the complete program but the checksum did not match. The data may have been corrupted during download.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
ERROR OCCURRED FLUSHING QUEUES	Yes	An interim message that displays while the printer discards host data it cannot use because a fault condition exists. While this message displays, the asterisk (*) rotates.	Wait. When the asterisk (*) stops rotating, a different fault message will appear; troubleshoot the final message.
FILE EXISTS Enable Overwrite	Yes	The printer operator tried to save a file using the name of an existing stored file.	Enter the PRINTER CONTROL menu and enable the Overwrite Files feature to overwrite the existing file.
FILE SYS FULL Add Flash	Yes/No	Insufficient Flash memory available to store file.	Install a larger flash memory SIMM. For additional Flash, contact your authorized service representative.

#### Table 10. LCD Message Troubleshooting (continued)

Displayed Message	Can User Correct?	Explanation	Solution
FILE SYS FULL Delete Files	Yes	Insufficient Flash memory available to store file.	Enter the PRINTER CONTROL menu. Use Delete Files to delete unwanted files.
FILE SYS FULL Optimize & Reboot	Yes	Insufficient Flash memory available to store file.	Enter the PRINTER CONTROL menu and use Optimize & Reboot feature.
FILE SYS INVALID Optimize&Reboot	Yes/No	File system not detected or Flash was corrupted.	Enter the PRINTER CONTROL menu and use Optimize & Reboot feature.
FILE SYS WRITE Check Flash	Yes/No	Problem writing to flash memory.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.
FRAMING ERROR	Yes	Serial framing error over a serial interface.	Match the serial interface settings of the printer to those of the host computer.
GAP NOT DETECTED Check Media	Yes	Printer is set for Transmissive or Reflective sensing, but a gap, notch, or stripe is not being detected. Gap Threshold is set too high or Paper Out Threshold is set too low.	<ol> <li>Check to see that the media installed matches the setting of the Gap Sense selection in the MEDIA CONTROL menu.</li> <li>Clean the sensor assembly and paper path.</li> <li>Perform the Paper Calibrate procedure described in this manual to improve the sensor's ability to detect the media in use.</li> <li>Manually change the Gap Threshold and/or Paper Out Threshold values.</li> </ol>
GRF CHK ERROR PRESS PAUSE	Yes	In the CT emulation over a twinax interface, the printer received a non-printable character.	Press the PAUSE key twice.
Half Speed Mode	Yes	The printer or the printhead are hot.	Let the printer cool down. Full speed will be restored when printing is resumed.
HEAD POWER FAIL	Yes/No	Printhead lost power.	<ol> <li>Replace the printhead.</li> <li>Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.</li> </ol>
IGP/PGL ERROR	Yes	Appears when the "Fault" option is selected from Error Report in the front panel.	Deselect "Fault" from Error Report on the front control panel.
INSUFFICIENT RAM Reboot/Add RAM	Yes/No	Not enough RAM memory available for a printer function.	<ol> <li>Power off the printer for 15 seconds, then power back on again.</li> <li>To add more RAM to memory to your printer, contact your authorized customer service representative.</li> </ol>

Displayed Message	Can User Correct?	Explanation	Solution
LABEL PRESENT Remove Label	Yes	<ol> <li>This is the normal message when Peel-off or Tear-off Media Handling has been selected.</li> <li>Label detected at front of the printer by the Label Taken Sensor.</li> <li>Incorrect media handling method is selected.</li> </ol>	<ol> <li>Remove the label from the front of the printer to allow the next label to print.</li> <li>Change the Media Handling selection in the MEDIA CONTROL menu to the correct option.</li> <li>Select Tear-Off Strip or Continuous to prevent the printer from stopping for label removal after each label is printed.</li> </ol>
LOADING PROGRAM FROM PORT XX%	Yes	The new emulation program is loading into printer RAM. XX% indicates how much of the program has loaded.	No action required.
LOADING PROGRAM INTO FLASH	Yes	A program is getting loaded into flash.	No action required.
PAPER OUT Load Paper	Yes	<ul> <li>The printer does not sense media.</li> <li>Media was not installed or has run out.</li> <li>A break in media has occurred.</li> <li>Media was not routed or installed correctly.</li> <li>Media is installed correctly, but the sensor is not detecting it.</li> <li>Gap Threshold value may be set too high and/or Paper Out Threshold may be set too low.</li> </ul>	<ol> <li>Install media. If a break occurred, reinstall the media. Press the PAUSE key to clear the fault. Ensure that the printhead assembly is completely closed. Check the media installation procedures beginning on page 31.</li> <li>If the media is installed correctly, the transmissive or reflective sensor may not be detecting it. Do the Paper Calibrate procedure to improve the ability of the sensors to detect the media being used.</li> <li>Check if the Gap Threshold is too high or the Paper Out Threshold is too low. Lower the Gap Threshold or raise Paper Out Threshold value.</li> <li>If using media with no transmissive gap or black strip, perform the Paper Calibrate to establish a valid Paper Out Threshold.</li> </ol>
PAPER OUT TIMEOUT	Yes	In the CT emulation with a coax interface, a time-out message is sent to the host if paper is not loaded within 10 minutes after PAUSE was pressed to clear a paper out fault.	Load media and run a print test. If the message persists, contact your authorized service representative.
PARITY ERROR	Yes	Parity error. (serial interface)	Check your serial host interface parameter settings. If necessary change them so they match the settings of the attached host.

Table TV. LCD Wessage Houseshould (Continued)
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Displayed Message	Can User Correct?	Explanation	Solution	
POWER SAVER MODE	Yes	This is a status message. The printer is in low–energy idle state, all fans and higher voltages are off, only +5Vdc logic circuits are active.	No action required.	
PRINT HEAD COLD See Manual	Yes	Printer is in a cold environment.	Place printer in a warmer location.	
PRINT HEAD HOT See Manual	Yes/No	The printhead has become overheated.	<ol> <li>Allow the printhead to cool down for 5 minutes, then press PAUSE. Resume printing.</li> <li>If problem persists, contact your</li> </ol>	
			authorized service representative.	
PRINT HEAD UP Close Print Head	Yes	Printhead is not closed and completely latched.	Close and latch the Printhead.	
PRINTER HOT	Yes/No	This message indicates internal temperatures over 60° Celsius (140° Fahrenheit).	<ol> <li>Determine that the fans are operating and that all air vents are unobstructed.</li> </ol>	
		Print jobs will not create such	2. Move printer to a cooler location.	
			<ol> <li>If problem persists after moving printer to a cooler location, contact your authorized customer service representative.</li> </ol>	
PWR SUPPLY HOT	Yes	Power supply is hot.	<ol> <li>Determine that the fans are operating and that all air vents are unobstructed.</li> </ol>	
			<ol> <li>Move printer to a cooler area.</li> <li>If problem persists, contact your authorized customer service representative.</li> </ol>	
RBN TAKEUP FULL	Yes	The takeup spool is full.	1. Empty the takeup spool.	
Remove Used Rbn			<ol> <li>If takeup spool is not full, try rethreading the ribbon.</li> </ol>	
Remove Label	Yes	Label has finished printing and waiting to be removed.	Remove label. Media Handling set to Peel-Off or Tear-Off mode.	
RESETTING PLEASE WAIT	Yes	Printer finished loading the program into flash memory and is automatically resetting itself.	No action required.	
RESTORING BOOT CODE	Yes	Normal download initialization message.	No action required.	
RIBBON BROKEN Reload Ribbon	Yes	Ribbon is broken between the ribbon take up spindle and the printhead.	Re-attach ribbon.	
RIBBON DETECTED In Direct Mode	Yes	Printer senses ribbon installed, but Print Mode is set for Direct thermal printing (printing where no ribbon is required).	<ol> <li>Remove the ribbon from the printer Direct Thermal media is being used</li> <li>Change the Print Mode from Direct to Transfer if thermal transfer printing i being used.</li> </ol>	

Table 10. LCD Message Troubleshooting (continued)
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Displayed Message	Can User Correct?	Explanation	Solution	
RIBBON FAULT Timeout	Yes	In the CT emulation, with a coax interface, the ribbon has not moved for 10 minutes after PAUSE was pressed to clear a ribbon fault.	<ol> <li>Clean the printer.</li> <li>Power off, wait 15 seconds, then power back on again. If message persists, contact your authorized customer service representative.</li> </ol>	
Ribbon Low	Yes	The supply spool is getting low.	<ol> <li>Replace ribbon.</li> <li>Change the Ribbon Low value in the Media Control menu to a lower value.</li> <li>Disable Ribbon Low in the Media Control menu.</li> </ol>	
RIBBON OUT Load Ribbon	Yes	The supply spool is empty.	Replace ribbon.	
SECURITY CODE VIOLATION	Yes	Software not correct for printer.	<ol> <li>Load correct software.</li> <li>Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.</li> </ol>	
SOFTWARE ERROR* Recycle Power	Yes/No	<ol> <li>Application software tried to perform an illegal printer function.</li> <li>There are damaged logic circuits on the Controller PCBA.</li> </ol>	<ol> <li>Recycle printer power. If possible, print a job that has previously worked.</li> <li>If problem persists, contact your authorized service representative.</li> </ol>	
TESTING HARDWARE PLEASE WAIT	Yes	Normal power-up Message. Printer is running its initialization routine.	<ol> <li>No action required.</li> <li>If the printer does not complete initialization and continues displaying this message when the CT emulation is installed, the expansion CT board may not be connected to the controller PCBA.</li> </ol>	
06 HOST REQUEST	Yes	Status message: in CT emulation, the host computer or printer controller requires attention.	Not a printer problem.	
08 HOLD PRINT TIMEOUT	Yes	Status message: in CT emulation, the printer was off- line more than 10 minutes and the "Intervention Required" parameter is set to "Send to Host."	Press PAUSE to put the printer online.	
15 COMM CHECK	Yes/No	Communication Check: a message that appears in the CT emulation meaning the line is not active on a twinax interface.	<ol> <li>Check your network for proper operation.</li> <li>Try a different cable from a known good device.</li> <li>If the problem persists, contact you authorized customer service representative.</li> </ol>	

Displayed Message	Can User Correct?	Explanation	Solution
22 INVALID ADDR	Yes	Invalid Address: poll time-out on the twinax interface indicating the unit address is not recognized by printer.	Have the system administrator make sure the printer address is correct.
27 CU TIMED OUT	Yes	Controller Unit Timed Out: the printer was not enabled for one minute or more on a coax interface.	Check cable connection and host system. (Refer to line problem determination procedures, as recommended by the host system.)
28 CU NOT ENAB	Yes	Controller Unit Not Enabled. Poll time-out-error. The printer was not polled for one minute across a coax interface.	Check cable connection and host system. (Refer to line problem determination procedures, as recommended by the host system.)
33 HEAD OPEN TIMEOUT	Yes	Status message in the CT emulation: the printer was offline more than 10 minutes and the "Intervention Required" parameter is set to "Send to Host."	Close and latch the printhead. Press PAUSE to put the printer online.
40V POWER FAIL	Yes	+40 VDC: an internal power failure.	Power off the printer for 15 seconds, then power back on again. If problem persists, contact your authorized customer service representative.

Table 10. LCI	) Message	Troubleshooting	(continued)
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# A Specifications

# Standard

# **Print Method**

	4400-004	4400-004	4400-006	4400-006	4400-008	4400-008
Print Resolution (dpi)	203	300	203	300	203	300
Min. Dot Size (sq. in)	.005	.0033	.005	.0033	.005	.0033
Bar Code Modulus (mils) Picket Fence Ladder	5 - 127 10 -127	6.7 - 110 10 - 110	5 - 127 10 - 127	6.7 - 110 10 - 110	5 - 127 10 - 127	6.7 - 110 10 - 110
Max. Print Speed (ips)	10	8	10	8	8	6
Max. Print Width (in.)	4.1	4.1	6.6	6.6	8.5	8.5
Standard Memory (MB)	4	4	8	8	8	8
Max. Print Length with standard memory (in.)(1)	46	21	75	35	59	27
Max. Print Length with 16MB memory expansion (in.)	99	99	99	99	99	99
NOTES:						

#### Table 11. Printing Specifications

# Media

### General

Туре:	Roll-fed, die-cut continuous or fanfold labels, tags or tickets; most direct thermal or thermal transfer materials.
Supply Roll:	8 in (203 mm) maximum diameter on 1.5" (37.5mm) to 3" (76 mm) diameter cores.
Internal Rewinder:	Accepts a 5 inch diameter roll of label backing.
Label Material:	Thermal transfer plain-coated papers, vinyl, Mylar, metallized paper, non-woven fabric, fine woven fabric, thermal-visible light scannable paper, infra- red scannable paper, thermal ticket/tag stock, ther- mally sensitive plastic stock.
Media Sensing:	Moveable "see-through" for die-cut labels and reflective for tags with black striping. The printer uses a movable sensor to detect index holes/notches or the black stripe in tag stock. The sensor position is indicated by the notch on the top of the sensor assembly.
Label Taken Sensor:	Detects when a printed label is at the printer exit throat.
Automatic Label Peel-Off:	Peels and presents label to the operator, one at a time.



Figure 9. Media Dimensions

#### Dimensions

Table	12.	Media	Specifications

		4400-004	4400-006	4400-008
А	Label Width Range (in.)	0.75 -4.5	2.0-6.8	3.0-8.75
В	Backing Width Range (in.)	0.75-4.5	2.0-6.8	3.0-8.75
С	Min. Gap/Hole/Notch Height (in.)	0.10	0.10	0.10
к	Min. Refl. Mark Height (in.)	0.10	0.10	0.10
I	Min Refl. Mark Width (in.)	0.5	0.5	0.5
Е	Media Thickness Range (mils)	2.5-10.0	2.5-10.0	2.5-10.0
D	Media Length Range (in.) <sup>1</sup>	0.25-99	0.25-99	0.25-99
G	Width of Inter-label gap/hole	0.25-0.50	0.25-0.50	0.25-0.50
<ul><li>Notes:</li><li>1. These figures are approximate and depend upon the active emulation.</li><li>2. Minimum values may vary depending upon the selected media handling mode.</li></ul>				

# Ribbon

Table 13. Ribbon	Specifications
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	4400-004	4400-006	4400-008
Ribbon Width Range (in.)	0.75-4.5	2.0-6.8	3.0-8.75
Max. Ribbon Length (m)	625	625	625

# **Indicators and Switches**

Indicator Lights:	ONLINE
Switches:	POWER
Keys:	PAUSE, JOB SELECT/ - (Decrement), FEED/↑ (Up), TEST PRINT,  (Menu), ★ (Cancel)/↓ (Down), ↓ (Enter)
Message Display:	2-row 16-characters per row for error mes- sages, print status, and recalling stored formats
Memory	
Flash Memory (standard)	4MB SIMM installed on Controller PCBA

DRAM

See Table 11.

## **Host Interfaces**

1.	Serial RS-232 or RS-422 at 600, 1200, 2400, 4800, 9600, 19200,
	38400, 57600, or 115200 baud.

2. Parallel (Centronics compatible) or IEEE 1284 bi-directional.

The RS-232 and RS-422 host interfaces shall have the following characteristics:

Character Set:	ANSI <sup>®</sup> ASCII character set
Word Length:	Selectable 7-bit or 8-bit data format
Handshaking:	XON/XOFF (in receive mode only) and CTS/ DTR
Input Buffer:	Selectable from 1k through 16 kbytes. XOFF is transmitted and DTR goes low when buffer is equal to or less than 25% of full. XON is transmitted and DTR goes high when buffer is 25% above empty. Characters are transmitted with no parity from the printer

#### Power

Power Source:	115 or 230 VAC 50/60Hz switching power supply.
Grounding:	Unit must be connected to a properly grounded receptacle.

# Environmental

41° F to 104° F (5° C to 40° C)
-40° F to 150° F (-40° C to 60° C)
20% to 85%, non-condensing 5% to 85% non-condensing
Free air movement
Non-conducting, non-corrosive

# Physical

	4400-004	4400-006	4400-008
Outside Dimensions (in.)	12H x 10W x 17D	12H x 14W x 17D	12H x 16W x 17D
Max. Weight (lbs)	35	45	50

# **Acoustic Specifications**

	4400 @ 6 ips	4400 @ 8 ips
Printing:	62 dBA	63 dBA
	7.4 Bel	7.5 Bel
Standby:	37 dBA	37 dBA
	5.2 Bel	5.2 Bel
Geraeuschemission nach ISO 9296		
Druckend:	62 dBA	63 dBA
	7.4 Bel	7.5 Bel
Betriebsbereit:	37 dBA	37 dBA
	5.2 Bel	5.2 Bel

Table 14. 4400 Acous	stic Noise Leve	els per ISO 9296
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# **Options**

Memory Expansion:16MB DRAM, 10MB Flash.Coax/Twinax Interface:Provides protocol converter functionality and<br/>connectivity for IBM coax/twinax host inter-<br/>facesEthernet InterfaceAvailable in 10/100Base-T configuration.<br/>Allows placing the thermal printer on a LAN<br/>rather than attaching it directly to a host sys-<br/>tem.

# **B** Printer Options

Options are offered with the printer to enhance its capabilities and to provide a large degree of application flexibility. A description of the option complement is given below. For field-installable options, installation instructions are provided with each option.

# **Hardware Options**

### **Memory Expansion**

The printer internal DRAM and Flash memories can be expanded to 16MB and 10MB respectively using SIMM modules.

# C

# Setting the Label Length

The following considerations should be observed when you set the label length.

- Physical Label Length is the actual length of the die-cut label material being printed on.
- Logical Label Length (Host Form Length) is usually the same measurable length as the Physical Label Length, but it can be programmed to be greater or less than the physical length of the label material installed on the printer. This results in the image being clipped off, moved to the next physical label, or have a blank space on the remaining portion of the physical label.
- In the default case any form or label length sent from an emulation (the ^L or ^H command in Code V and the length defined within the ~CREATE statement in PGL) will be used to force the label length.
- The Top-of-Form sensor is used to establish the Top-of-Form position, based on the trailing edge of the gap. The label gap sensor does not control the physical label length that the printer is using. Instead, the printer continues to use the Label Length (found under the MEDIA CONTROL menu) or Host Forms Length value sent to the printer. Therefore, you must set the Label Length properly, either through the control panel or through the host, even if the Top-of-Form sensor is enabled.

If the label length you have selected (either from the control panel or through the host) does not match the physical label length, then the printer will attempt to map the logical label onto the physical label.

If the user-selected label length is shorter than the physical label length, the printer will leave white space at the end of the label so that the next logical label will start at the beginning of the next physical label. If the user-selected label length (logical) is 1.5 times greater than the physical label length, the printer will clip the label to fit onto the physical label when the Clip Page option is enabled under the MEDIA CONTROL menu. In this case, the printable data that was not printed is lost. With Clip Page disabled, the remaining printable data would be printed starting at the Top-of-Form position on the next label, after a paper advance.

The following recommendations indicate how best to set up the printer and use the Top-of-Form sensor.

- If the application sends the logical label length to the printer, then there is probably nothing to change in the setup (other than to enable the Top-of-Form sensor). The printer will use the Host Form Length for the logical label length, and the application will also be using it. As long as the physical label length is really the same as the logical label length (which it should be), the printer will operate normally.
- If the application sends the logical label length to the printer but it is inaccurate (e.g., you wish to fit two logical labels onto one physical label), then you must make sure that Host Form Length under the EMULATION menus is set to Disable (factory default) and must also set the Label Length under the MEDIA CONTROL menu in the control panel to the physical label length.
- If the application does *not* send the label length to the printer, then you must select the label length from the control panel. This value must be accurate, both in terms of what the application expects and the physical label length. If it does not match the physical label length, then there will be clipping or extra white space.
- The Label Length range may be limited to when the Label Width value is set to the maximum printing width of the printer. Decreasing (narrowing) the Label Width value will extend the limits of the Label Length range that you can select—up to a maximum of 99.0 inches.

# **D** ASCII Control Codes

Char	Dec	Hex									
NUL	0	00		32	20	@	64	40	`	96	60
SOH	1	01	!	33	21	А	65	41	а	97	61
STX	2	02	+	34	22	В	66	42	b	98	62
EXT	3	03	#	35	23	С	67	43	с	99	63
EOT	4	04	\$	36	24	D	68	44	d	100	64
ENQ	5	05	%	37	25	Е	69	45	е	101	65
ACK	6	06	&	38	26	F	70	46	f	102	66
BEL	7	07	+	39	27	G	71	47	g	103	67
BS	8	08	(	40	28	Н	72	48	h	104	68
HT	9	09	)	41	29	I	73	49	i	105	69
LF	10	0A	*	42	2A	J	74	4A	j	106	6A
VT	11	0B	+	43	2B	К	75	4B	k	107	6B
FF	12	0C	,	44	2C	L	76	4C	I	108	6C
CR	13	0D	-	45	2D	М	77	4D	m	109	6D
SO	14	0E		46	2E	Ν	78	4E	n	110	6E
SI	15	0F	/	47	2F	0	79	4F	0	111	6F
DLE	16	10	0	48	30	Р	80	50	р	112	70
DC1	17	11	1	49	31	Q	81	51	q	113	71
DC2	18	12	2	50	32	R	82	52	r	114	72
DC3	19	13	3	51	33	S	83	53	S	115	73
DC4	20	14	4	52	34	Т	84	54	t	116	74
NAK	21	15	5	53	35	U	85	55	u	117	75
SYN	22	16	6	54	36	V	86	56	v	118	76
ETB	23	17	7	55	37	W	87	57	w	119	77
CAN	24	18	8	56	38	Х	88	58	х	120	78
EM	25	19	9	57	39	Y	89	59	у	121	79
SUB	26	1A	:	58	ЗA	Z	90	5A	z	122	7A
ESC	27	1B	;	59	3B	[	91	5B	{	123	7B
FS	28	1C	<	60	3C	١	92	5C		124	7C
GS	29	1D	=	61	3D	]	93	5D	}	125	7D

#### Appendix D

Char	Dec	Hex									
RS	30	1E	>	62	3E	^	94	5E	~	126	7E
US	31	1F	?	63	3F	_	95	5F		127	7F
Ç	128	80	á	160	A0		192	C0	+	224	E0
ü	129	81	í	161	A1		193	C1	_	225	E1
é	130	82	ó	162	A2		194	C2	+	226	E2
â	131	83	ú	163	A3		195	C3	+	227	E3
ä	132	84	ñ	164	A4		196	C4	_	228	E4
à	133	85	Ñ	165	A5		197	C5	+	229	E5
å	134	86	а	166	A6	_	198	C6		230	E6
ç	135	87	_	167	A7	+	199	C7	•	231	E7
ê	136	88	ć	168	A8		200	C8	_	232	E8
ë	137	89	«	169	A9		201	C9	+	233	E9
è	138	8A		170	AA		202	CA	_	234	EA
ï	139	8B	1/2	171	AB		203	СВ	+	235	EB
î	140	8C	1/4	172	AC		204	СС	_	236	EC
ì	141	8D	i	173	AD		205	CD	_	237	ED
Ä	142	8E		174	AE		206	CE		238	EE
Å	143	8F		175	AF		207	CF		239	EF
É	144	90		176	B0	_	208	D0		240	F0
æ	145	91		177	B1	+	209	D1	_	241	F1
Æ	146	92	@	178	B2	+	210	D2		242	F2
ô	147	93	#	179	В3	+	211	D3	3/4	243	F3
ö	148	94		180	B4	+	212	D4		244	F4
ò	149	95	+	181	B5		213	D5		245	F5
û	150	96	+	182	B6	-	214	D6	_	246	F6
ù	151	97	+	183	B7	+	215	D7		247	F7
ÿ	152	98	_	184	B8	+	216	D8	0	248	F8
Ö	153	99	1	185	B9		217	D9	ć	249	F9
Ü	154	9A		186	BA		218	DA	I	250	FA
0	155	9B	»	187	BB		219	DB		251	FB
£	156	9C		188	BC		220	DC		252	FC
+	157	9D	¢	189	BD		221	DD		253	FD
x	158	9E	¥	190	BE	+	222	DE		254	FE
_	159	9F		191	BF		223	DF		255	FF

**NOTE:** For the hardware handshake XON/XOFF commands: XON = Ctrl Q (DC1)

XON = Ctr	1 Q (DC1)
XOFF = C	trl S (DC3)

# E Glossary

Baud (rate)	Baud Rate is the number of information bits that can be transmitted between the printer and the computer in one second. For example, one baud equals one bit per second in a series of binary signals. Both the printer and the computer must be configured to the same baud rate.
BIT	Binary digIT. A digit in the binary number system, represented by a 0 or a 1. A bit is the smallest unit of storage in a digital computer.
Boot-up	The start-up procedure which causes a computer operating system to be loaded into main memory.
Buffer	An area of storage into which data are read or written temporarily during data transfers.
Coax	Coaxial cable. A type of cable with a single wire surrounded by insulation and a braided shield.
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 are set to match the operating characteristics of the host computer system.
Continuous Media	Media comprised of one continuous length without a gap, notch, hole or black stripe to establish a predetermined label or tag length. With this media type, the Host Form Length or user selected Label Length sets the desired length of each label.
Controller	An independent functional logic unit in a data processing system that controls data paths between one or more units of peripheral equipment.
Data Bits	Binary information sent to the printer; a character set grouping containing letters, digits, and punctuation marks to be printed.
Default	A value, parameter, attribute, or option that is assigned by a program or system when another has not been specified by the user.
Diagnostic	Pertaining to the detection and isolation of a printer malfunction or mistake.

\_\_\_\_

Direct Thermal Media	Media coated with special chemicals that act as an accelerator, acceptor dye and binder. In Direct Thermal mode the heat from the selected rectangular elements in the thermal printhead makes direct contact with the media (no ribbon is used) and causes a chemical reaction that creates the image on the media.
Direct Thermal Printing	A printing method in which no ribbon is used to transfer data from the printhead to the media to create an image. The thermal printhead selectively heats small rectangular elements which make direct contact with the coated media.
DRAM	Dynamic Random Access Memory. Can be read from or written to at any time. DRAM is volatile: Whatever is in DRAM is lost when power is turned off.
EPROM	Erasable Programmable Read Only Memory. Programs, instructions, and routines permanently stored in the printer that cannot be written to. Files in EPROM are not lost when power is turned off. (Resident fonts are fonts permanently stored in EPROM and available at any time, via software commands.)
Fanfold Media	Media supplied in a fanfold stack instead of a roll format.
Flash Memory	Nonvolatile memory. See Nonvolatile Memory.
Font	A collection of printing characteristics for printing alphanumeric characters, all of which combine to produce a distinctive style of print.
Host Computer	The computer that stores, processes, and sends data to be printed, which communicates directly with the printer. The term "host" is used to indicate the controlling computer, since modern printers are themselves microprocessor-controlled computer systems.
Interface	The hardware component used to link two devices by common physical interconnection, signal, and functional characteristics.
IPS	The speed at which the media is printed based on a rate of Inches-Per-Second.
Label Liner (backing)	The material labels are attached to during their manufacturing process. Attachment is usually accomplished with an adhesive. After printing, labels can be easily removed from the liner and the liner discarded or recycled.

Label Taken Sensor	A sensor located at the front of the printer to detect the presence of a label positioned under it. The sensor is used only during Peel-Off and Tear-Off Media Handling to sense a label and then detect its removal prior to printing the next label.
Media	Material onto which data is printed by the printer. The types of media supported by the printer are die-cut labels or tagstock, supplied in roll or fanfold format. Media is further described by the type of sensing used to detect the Top of Form position of its predetermined length. Transmissive media uses a liner gap, notch or hole between labels and Reflective media uses a horizontal black stripe located on the back of the tagstock or label liner. Continuous media uses no sensing method and the operator determines which label length is desired.
Media Sensor	The sensor used to detect the presence of media in the paper path, as well as, the gap, notch, or hole position of Transmissive media or the horizontal black stripe on Reflective media.
Memory	See RAM, Nonvolatile Memory, DRAM, and Flash Memory.
Nonvolatile Memory	Nonvolatile memory stores variables that must be preserved when the printer is turned off, such as configuration parameters and printer usage statistics. Nonvolatile memory is preserved because RAM is housed on the controller board, which contains an independent, battery-operated power supply. When printer power is turned off, the battery supplies the power needed to keep stored data active. Nonvolatile memory also includes storage in disk.
NOVRAM	Acronym of Nonvolatile Random-Access Memory. See Nonvolatile Memory.
Parity (check)	Parity checking is the addition of a non-data bit to data, resulting in the number of "1 bits" being either always even or always odd. Parity is used to detect transmission errors. Parity represents value in the check digit of the received or transmitted data.
РСВА	Printed Circuit Board Assembly. A PCB with components (ICs, resistors, capacitors, etc.) installed.
Port	A data channel used for receiving data from or transmitting data to one or more external devices.
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.
RAM	Random-Access Memory. Also called "main memory" or "working memory". It is the active memory of the printer, into which programs are loaded. RAM is saved to volatile memory because data in RAM is lost when power is turned off or interrupted.
Resolution	A measure expressing the number of component units in a given range used to create an image; in printing, expressed as the number of dots per inch (dpi) horizontally and vertically.
Roll Media	Media supplied in a roll format, usually wound on a 1" or 3" cardboard core. The T5000 media support assembly accepts both core sizes.
Slew	Vertical paper movement.
Stop Bits	The signal which indicates the end of a character or element.
Thermal Transfer Media	Media specifically designed to work with a ribbon for image transfer. In Thermal Transfer mode, compatibility between the ribbon and the media is critical in producing a high quality long lasting image.
Thermal Transfer Printing A printing method in which the printhead presses a specially coated ribbon against the media. The printhead elements react with the ribbon and bond the image to the media.	
Twinax	Twinaxial. A type of cable with two wires surrounded by insulation and a braided shield.
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