PRINTRONIX®

User's Manual

T4204 Label Printer

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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.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Printronix is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by any unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Canadian Department of Communications Compliance Statement: This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformite aux normes du ministere des Communcations du Canada: Cet appareil numerique de la classe A est conform á norme NMB-003 du Canada.

European Community (EC) Conformity Statement:
This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Printronix cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-Printronix option cards.

German Conformity Statement:
Zulassungsbescheinigung Gesetz über die elektromagnetische Verträglichkeit von Geraten (EMVG) vom 30. August 1995

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen das EG-Konformitätszelchen - CE - zu führen.

Der Außteller der Konformitätserklärung ist die Printronix......(1)

Informationen in Hinsicht EMVG Paragraph 3 Abs. (2) 2:

Das Gerät erfüllt die Schutzanforderungen nach EN 50082-1 und EN 55022 Klasse A.

EN 55022 Klasse A Geräte bedürfen folgender Hinweise:

Nach dem EMVG: "Geräte dürfen an Orten, für die sie nicht asreichend entstört sind, nur mit besonderer Genehmigung des Bundesminesters für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind." (Auszug aus dem EMVG, Paragraph 3, Abs. 4) Dieses Genehmigungsverfahren ist nach Paragraph 9 EMVG in Verbindung mit der entsprechenden Kostenverordnung (Amtsblatt 14/93) kostenpflichtig.

Nach der EN 55022: "Dies ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzkommen."

Anmerkung: Um die Einhaltung des EMVG sicherzustellen sind die Geräte, wie in den Handbüchern angegeben, zu installieren und zu betreiben.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to 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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這是甲類的資訊產品,在居住的環境中使用時,可
能會造成射頻干擾,在這種情況下,使用者會被要
求採取某些適當的對策。

注意
　　この装置は、第一種情報技術装置です。この装置を家庭環境で使用すると
電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を
講ずるよう要求されることがあります。　　　　　　　　　　VCCI-A

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PRINTER WARRANTY

Printronix® warrants to purchaser that under normal use and service, this printer (excluding the thermal printhead) purchased hereunder shall be free from defects in material and workmanship for a period of ninety (90) days from the date of shipment from Printronix.

Consumable items such as media and ribbons are not covered under this warranty. This warranty does not cover equipment or parts that have been misused, altered, or used for purposes other than those for which they were manufactured. This warranty also does not cover loss, shipping damage, damage resulting from accident or damages resulting from unauthorized service.

THERMAL PRINTHEAD

Printronix warrants the printhead for a period of ninety (90) days, or 1,000,000 linear inches (Thermal Transfer/Direct Thermal) of use, whichever comes first. The warranty does not cover printheads that have been misused, damaged due to improper cleaning, or damaged due to use of improper ribbons or media.

SUPPLIES

For the number of the nearest Printronix full-service distributor that carries Printronix genuine supplies, please call 1-800-733-1900 or fax 714-368-2354. Supplies design, specification, and selection are critical and integral to the development of any computer imaging system. Printronix's extensive manufacturing and research capabilities, along with years of experience in the design of printers and their applications, assures that you will receive the exact materials that you require to maximize the performance of your Printronix printer. Further information can be obtained by calling the Printronix ThermaLine Help Desk at 714-368-2488 or from the Printronix Web Page at www.printronix.com.

ON-SITE MAINTENANCE SERVICE

Printronix offers on-site support services in the United States. Please contact the Printronix Maintenance Contracts Group at (714) 368-2798, for detailed service agreement information.

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Table of Contents

1 *Introduction*

Printronix ThermaLine Help Desk

The Printronix ThermaLine® Help Desk offers technical support with:

- Installation
- Configuration and Setup
- Operation and Supplies Loading
- Specifying the proper media and ribbon
- Post sales service support questions

Call the Printronix ThermaLine Help Desk at (714) 368-2488 or visit the Printronix Web Page at www.printronix.com.

Warnings And Special Information

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

WARNING **Conditions that could harm you as well as damage the equipment.**

WARNUNG **Achten Sie auf folgendes, um keine Personen in Gefahr zu bringen bzw. das Gerät zu beschädigen.**

AVISO **Condiciones que pueden causar daños a personas y equipos.**

AVERTISSEMENT **Conditions à respecter pour éviter tout danger corporel et dommage matériel.**

AVVERTENZA **Condizioni che possono arrecare danni alle persone e alle apparecchiature.**

CAUTION **Conditions that could damage the printer or related equipment.**

IMPORTANT **Information vital to proper operation of the printer.**

NOTE: Information and helpful tips about printer operation.

Conventions

Throughout this manual, keys and possible key settings or positions are printed in UPPERCASE type.

In most cases, messages displayed in the liquid crystal display (LCD) are shown in the following format:

```
PRINTER CONTROL
Print Speed
```

The T4204 Label Printer

The T4204 is a high quality, direct thermal and thermal transfer printer specifically designed for printing labels and tags, from any MS-DOS®, Windows®, or ASCII based compatible computer.

Features

- Thermal transfer and direct thermal printing.
- Supports over 20 types of bar codes.
- Download forms, fonts and graphics to printer memory.
- High resolution print head for sharp graphics and text.
- Built-in label rewinder for batch processing or 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 automatically positioning the last label of the print job at the tear off position when the print buffer is empty.
- 4MB DRAM memory.
- 4MB Flash memory.

Printronix 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®-compatible parallel, IEEE® 1284 compliant parallel, and, optionally, coax/twinax host connections or Ethernet® 10Base-T, or 10/100 Base-T. The interface cable needed to connect the printer to the host device must be supplied by the user.

Thermal Printer Technology

Quiet and fast, with excellent print quality, the T4204 multifunction label 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

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 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. The Dynamic Print Control is a history control whose output is based on the results of the previous printing. The printer predicts the quantity of heat required to print dots and regulates the electrical energy applied to the printhead. 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.

Media Selection

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

NOTE: Do not attempt to use direct thermal media with ribbon. The printable surface of direct thermal media is very slick and will fail to advance ribbon at the proper speed resulting in poor print quality.

Thermal Transfer Media is paper designed to be used with a transfer ribbon. Once your specific label requirements are identified, you will need to select the ribbon and media combination that will satisfy you needs.

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

You should use a Genuine Printronix Thermal Ribbon in your printer. Printronix offers a wide range of thermal transfer media, such as film or synthetic paper substitutes that are excellent in their ability to transfer an image (print quality) and in scratch resistance (long storage). Most of these media options can be die-cut for easy label applications. The wide selection of media sizes and face stocks have been tested with Printronix ribbons for print quality and usage. Consult your Genuine Printronix Supplies Catalog or contact the factory. Further information can be obtained by calling the Printronix ThermaLine Help Desk at (714) 368-2488 or from the Printronix Web Page at www.printronix.com.

Emulations

The T4204 has the standard Printronix LinePrinter Plus® (LP+) emulation which provides direct compatibility with Printronix P-series printers. In addition, the printer has co-resident Printronix IGP®/PGL® and IGP/VGL emulations which provide printer system commands for text, barcodes, graphics, lines, and boxes.

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Hardware Options

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

• Fonts

    A selection of fonts is available to extend the capabilities of the standard resident fonts.

• Media Cutter

    The cutter is used to automatically cut printed media when the media exits the printer.

• Label/Tag Catcher Tray

    Used with the Media Cutter option to catch the cut media and collect it away from the Media Cutter Assembly.

• Twinax/Coax Host Interface

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

• PrintNet® Servers

    Allows the user to attach the T4204 to a LAN (Local Area Network) rather than attaching it directly to a host system. PrintNet servers support Ethernet only.

    PrintNet servers are available as an internally installed factory option, mounted inside the printer with the 10Base-T (UTP) connection only.

    PrintNet servers are also available as an externally mounted factory or field option with either a 10Base-T (UTP) or 10/100 BaseT connection. The external PrintNet field option is user installable and connects to the Centronics parallel port at the back of the T4204 printer.

NOTE: When the Twinax/Coax Interface option is installed and a PrintNet option is also required, an External PrintNet option must be used. The Internal PrintNet option is not supported with the Twinax/Coax Interface option installed.

Labels can be designed and printed using the following:

• Printronix LP+

• Printronix IGP/PGL or IGP/VGL graphics languages

Bar Code Verification

The most important consideration when printing a bar code is to ensure the bar code will be scanned properly. Incorporating a bar code quality procedure in the printing process is the best way to ensure that bar codes are being printed correctly. A properly implemented verification procedure will increase overall bar code quality, reduce waste from misprinted bar codes, and achieve high first time read rates, which is an increasingly important factor in newer, more efficient systems, where manually entered data is not acceptable as a back up function. Verification also minimizes the costs of returned products due to poor reading or unaccountable bar codes.

RJS designs and manufactures the world's most complete line of bar code verification products, including their portable Inspector and Laser Inspector models, On-Line Inspector and AutoScan II series. For more information on RJS bar code verifiers, contact their corporate headquarters at 562-994-0930, or visit their web site at **www.rjs1.com**.

Unpacking The Printer

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

CAUTION   **The discharge of electrostatic energy that accumulates on the surface of the human body or other surfaces can damage or destroy the print head or electronic components used in this device.**

CAUTION   **Damage to the printer interface connector may result from placing the T4204 printer on its backside during unpacking or handling.**

1. Open the top (and right side) cover by lifting the lip on the lower right side of the cover.
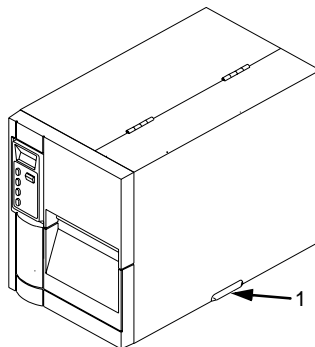
Legend:

1) Lip on lower right side of cover

2. Remove the tape securing the label rewind clip to the label rewind spindle.
3. Place the Media Roll Guide in the down position.

4. Remove the sample roll of Printronix ribbon and media from the support assembly and set them to one side.
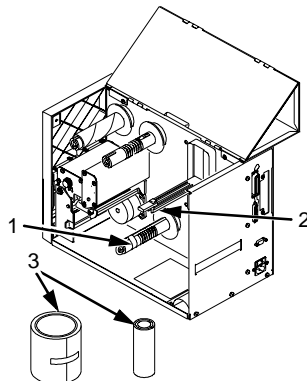
Legend:

1) Tape securing label rewind clip
2) Media Roll Guide
3) Ribbon and Media Sample Rolls

Check List

Your T4204 kit contains the items listed below.

- The T4204 printer.
- AC Powercord (not illustrated)
- Programmer's Manual Order Card (not illustrated).
- Printer User's Manual (not illustrated).
- Printhead Cleaning Pen (not illustrated)
- Terminating Resistor Packs (not illustrated)
- Ribbon Take-Up Core (cardboard) mounted in printer.
- Label Rewind Bracket mounted in printer
- Sample Roll of Printronix Prime Wax Ribbon 4.33" x 164'
- Starter Kit Roll of Printronix 110 Media (100 4.0" x 6.0" labels)

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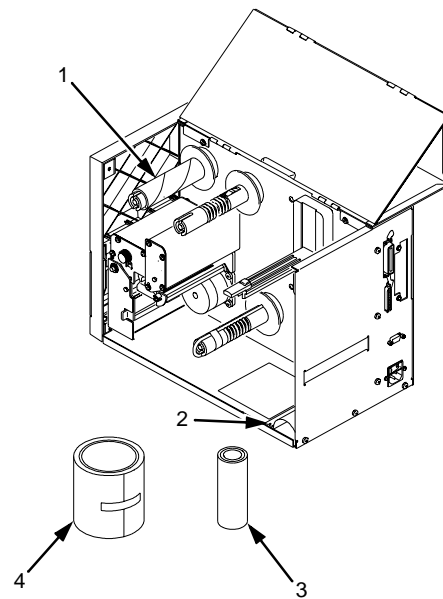
Legend:

1) Ribbon Take-Up Core (cardboard)
2) Label Rewind Bracket in stored position
3) Sample Roll of Prime Wax Ribbon
4) Sample Roll of 110 Media

Printer Installation

The following sections will guide you through the installation of the T4204.

WARNING **The printer should never be operated in a location where the operator and printer can get wet. Personal injury could result.**

WARNUNG **Der Drucker sollte grundsätzlich nicht an einem Ort aufgestellt und betrieben werden, an denen der Benutzer oder der Drucker naß werden könnten, da dies zu Schäden führen könnte.**

AVISO **La impresora nunca deberá utilizarse en un lugar en el que el operador y la impresora puedan sufrir los efectos de la humedad. De lo contrario, podrían producirse daños a personas.**

AVERTISSEMENT **Ne faites jamais fonctionner l'imprimante dans un endroit où l'opérateur et l'imprimante peuvent être mouillés. Il y a risque de préjudice physique.**

AVVERTENZA **Onde evitare il rischio di lesioni personali, non utilizzare mai la stampante in luoghi in cui l'operatore e la stampante possano venire a contatto con liquidi.**

1. Place the printer in a suitable location 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 (0) position.

3. Attach the AC power cord to the AC power receptacle in the rear of the printer.
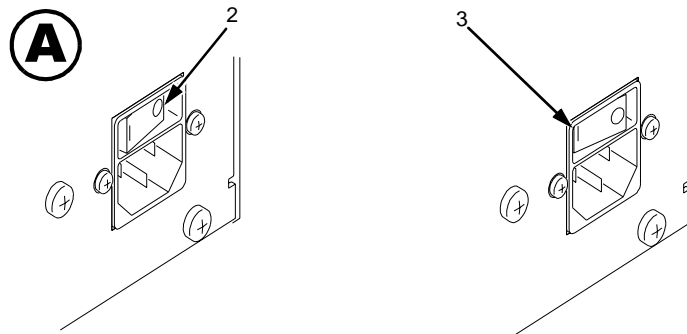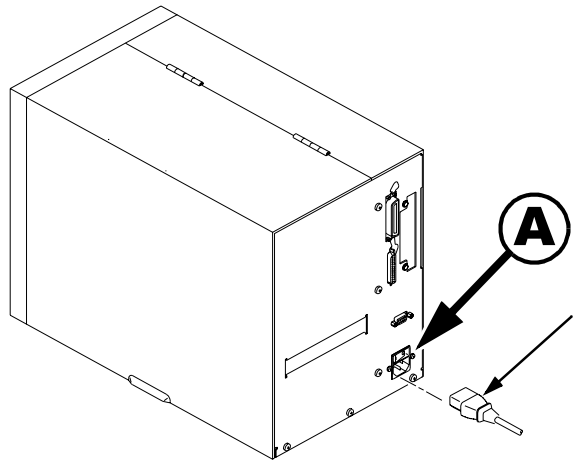
Legend:

1) AC Power Cord
2) Power Switch Off (0) Position
3) Power Switch On (l) Position

WARNING **Verify the required voltage on the printer's model number label on the rear of the printer.**

WARNUNG **Überprüfen Sie die erforderliche Spannung an dem Modellschild auf der Druckerrückseite.**

AVISO **Compruebe el voltaje requerido que figura en la etiqueta del número de modelo de la impresora que figura en su parte posterior.**

AVERTISSEMENT **Vérifiez la tension requise sur l'étiquette du numéro de série de l'imprimante, qui est accolée sur la partie arrière de l'imprimante.**

AVVERTENZA **Verificare la tensione richiesta sulla targhetta del numero di serie posta sul retro della stampante.**

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

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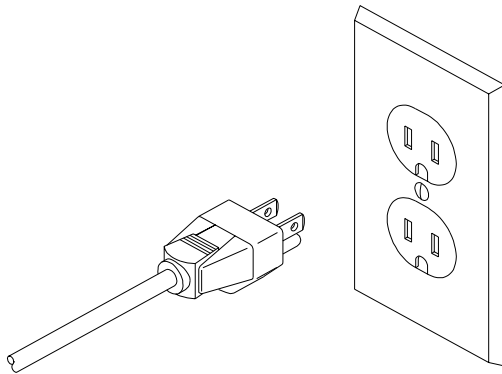
5. Attach The Interface Cable

    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.
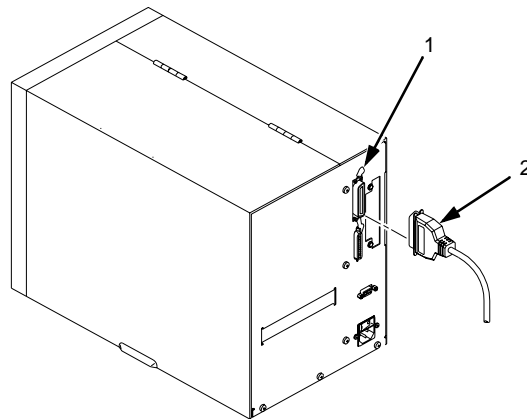
Legend:

1) Centronics parallel interface cable
2) Bail lock

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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 Chapter 4, page 185.
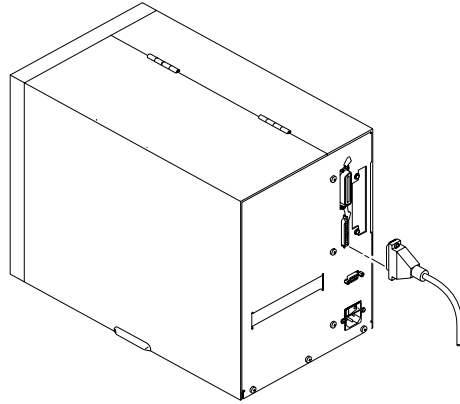
NOTE: The printer supports simultaneous connection of the Parallel and Serial interfaces using the Auto Switching feature. See Auto Switching described on page 78.

2 *Operation*

Controls & Indicators

All of the T4204 printer controls and indicators, except for the power switch, are located on the front panel of the printer, on either the Primary Control Panel (upper keys), or the Secondary Control Panel (lower keys).
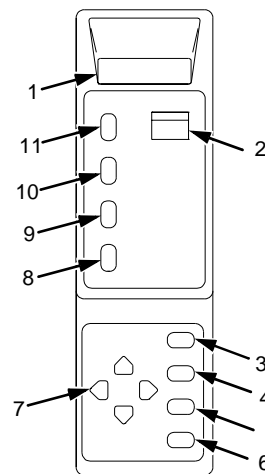
Legend:

1) LCD (Liquid Crystal Display)
2) ONLINE Status Indicator
3) CLEAR Key
4) PRT CONFIG Key
5) JOB SELECT Key
6) ENTER Key
7) Directional "Arrow" keys (4)
8) TEST Key
9) CANCEL Key
10) FEED Key
11) PAUSE Key

The Primary Control Panel is located at the top left of the printer, on the front panel. It is accessible with the printer front door either opened or closed. The panel has a back-lighted Liquid-Crystal Display (LCD), ONLINE status indicator, and PAUSE, FEED, CANCEL, and TEST keys.

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The Secondary Control Panel is behind the front door assembly below the Primary Control Panel. It consists of UP, DOWN, PREV, and NEXT arrow keys to navigate through the printer configuration menus, and CLEAR, PRT CONFIG, JOB SELECT, and ENTER keys for performing specific functions in the offline mode or within the printer configuration menu.

The POWER Switch

The POWER SWITCH is located on the back panel of the printer, in the bottom left corner. Placing this switch in the ON (1) position applies power to the printer. An illuminated LCD Message Display indicates the printer power is ON.
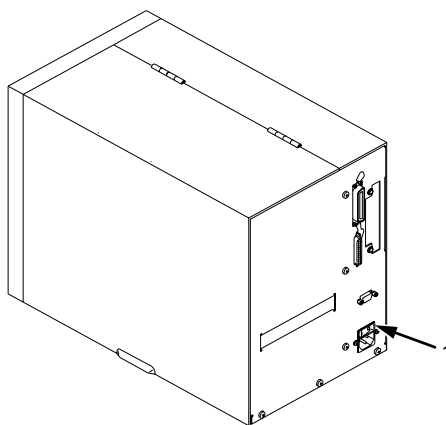
Legend:

1) Printer Power Switch

Powering On The Printer

When you power on the printer, the T4204 executes a self-test. The default power-up state is online. Once the printer has successfully initialized, the ONLINE status indicator light will go on, and the LCD indicates the communication interface selected and the type of emulation installed. The interface is indicated by PARL for parallel and SERL for serial.

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.

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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.

Primary Control Panel Keys

PAUSE - Toggles the printer between online [twinax only] and offline modes.

FEED - Advances the media one forms length (active in online or offline modes).

CANCEL - Cancels all data in the printer (active in online or offline modes). This key is set to disable from the factory. CANCEL can be enabled in the MAINT/MISC menu.

TEST - Selects the self-test menu (offline mode only). Pressing the ENTER key with a Diagnostic Test displayed initiates the test. Pressing the ENTER key again terminates the test. Press FEED to advance media and clear test data from the print buffer before returning the printer to the online mode.

Secondary Control Panel Keys

CLEAR - If a fault condition exists, pressing the CLEAR key clears the fault message and returns the printer to offline mode.

NOTE: If the fault condition has not been corrected before pressing CLEAR, the fault message appears again when attempting to place the printer to online status.

PRT CONFIG - Prints the current printer configuration menu settings.

JOB SELECT - Selects a specific printer configuration menu (offline mode only).

ENTER - Selects the current value within the printer configuration menu (offline mode only) and displays an asterisk (*) next to the value. If the 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 UP and DOWN keys at the same time unlocks the ENTER key and permits value selection.

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UP (▲) - Navigates the printer menu one level up (offline mode only).

DOWN (▼) - Navigates the printer menu one level down (offline mode only).

PREV (◀) - Navigates between options on the current level of the printer menu (offline mode only).

NEXT (▶) - Navigates between options on the current level of the printer menu (offline mode only).

UP+DOWN (▲ + ▼) - Simultaneously pressing these keys unlocks or locks the printer menu (offline mode only).

NEXT+PREV (▶ + ◀) - Simultaneously pressing these keys enables a printer soft reset (offline only).

Loading Media

The term "media" as 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 T4204 can print on continuous paper, adhesive backed labels or non-adhesive tags packaged in roll or fanfold form.

See Appendix B for a list of supplies available from Printronix.

CAUTION **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.**

CAUTION **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. Genuine Printronix Supplies can be ordered from the Printronix Distributor where you purchased this printer. Please refer to Appendix B for sizes and part numbers.**

IMPORTANT **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 Recovery sub-menu of the PRINTER CONTROL menu, and save it as the power-on default. Error Recovery forces the printer to automatically reprint a label that may have been partially printed prior to the LOAD PAPER fault message, after additional labels are properly loaded.**

Loading Roll Media

1. Open the top (and right side) cover.

2. Open the front door.

3. Slide the media roll guide down to the end of the media support assembly.

4. Open the printhead assembly by pushing the release lever towards the back of the printer. The Printhead assembly will swing upwards.
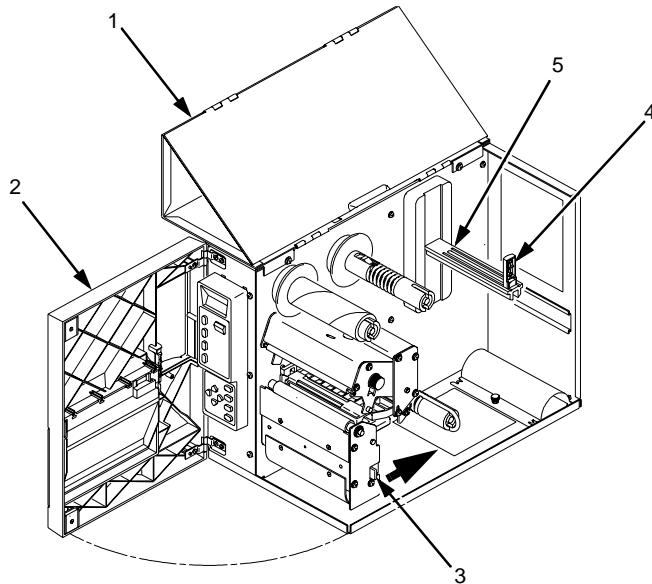
Legend:

1) Top Cover
2) Front Door
3) Printhead Assembly Release Lever
4) Media Roll Guide
5) Media Support Assembly

5.   Slide the media width adjustment tab to the outside stop of the media sensor assembly and rotate the tab up.
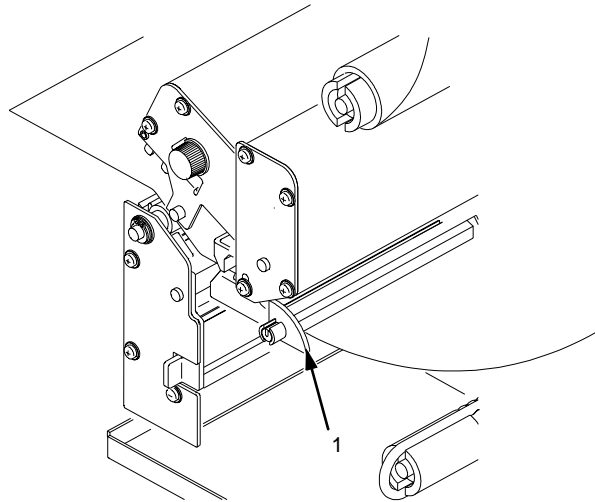
Legend:

1)   Media Width Adjustment Tab

6. Slide a roll of media over the media roll guide and onto the support assembly. Media feeds from the top of the roll and towards the front of the printer. Push the roll to the back of the support and slide the roll guide against the outer edge of the media.

7. Thread the label stock through the label sensor assembly and then between the platen (drive roller) and the printhead. You can also refer to the Loading A New Roll or Ribbon illustration label on the inside rear panel of the printer.
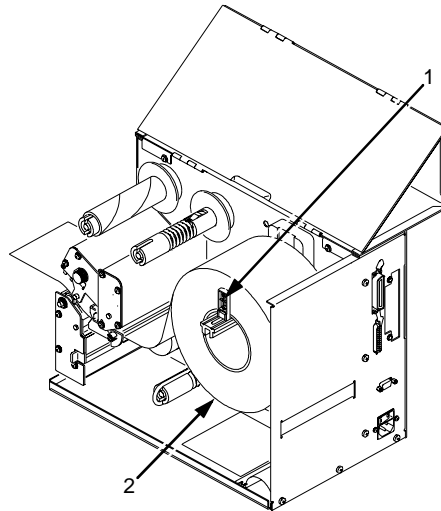
Legend:

1) Roll Guide
2) Media Roll

8. Rotate the media width adjustment tab down and slide it inward until it is flush with the media. Check the location of the media sensor, and refer to Sensor Assembly Horizontal Adjustment on page 47.

Legend:

1) Media Width Adjustment Tab

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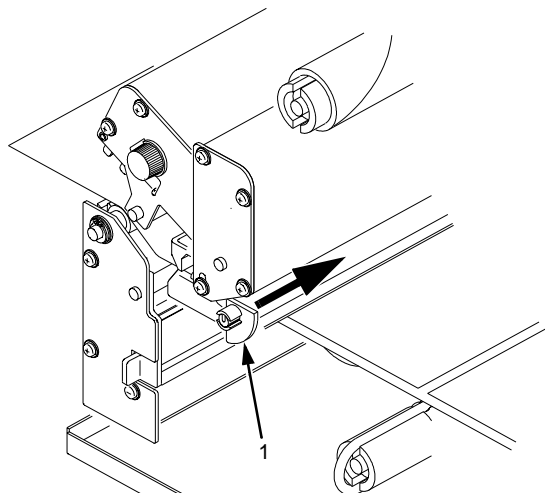
9. Close the printhead by pressing down on both sides of the front of the printhead assembly.

10. Adjust the media pressure control knob to match the width of the label stock in use.

Media Width	Pressure Control Knob Settings
2 inches or Less	2 inches
Greater Than 2 inches	4 inches
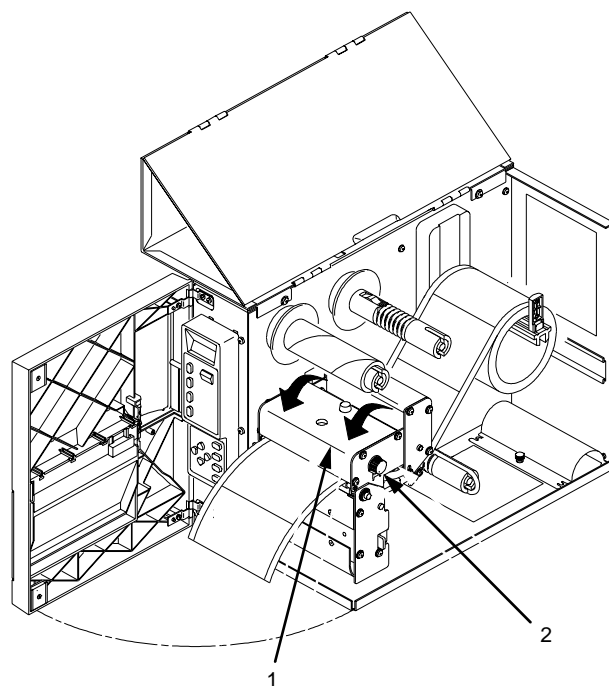
Legend:

1) Printhead Assembly
2) Media Pressure Control Knob

CAUTION **Ensure the printhead is down and latched before attempting to print. Failure to do so may cause a premature failure of the printhead.**

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11. Press the FEED key once to verify that the media advances.

   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 38. The Print Mode submenu is located in the PRINTER CONTROL Main Configuration menu. See "Printer Control Menu" on page 91 for more information. Close the printer's front door and top (and side) cover if the rewind or thermal transfer options are not needed.

12. Press the PAUSE key to place the printer online.

   The printer is now ready for printing.

IMPORTANT   **The printer will not automatically detect a fault condition when the printhead is open. When using Transmissive or Reflective media, if the printhead assembly is opened and media is moved, repositioned, or replaced, you must press the FEED key after the printhead is locked for media to advance to the Top-of-Form position.**

Loading Fanfold Media

1. Open the top (and right side) cover on the printer and the front door.

2. Remove the roll media from the media support assembly, if installed.

3. Place the fanfold media behind the printer and insert the first few labels through the rear panel opening.

4. Open the printhead assembly by pushing the release lever towards the back of the printer. The Printhead assembly will swing upward.
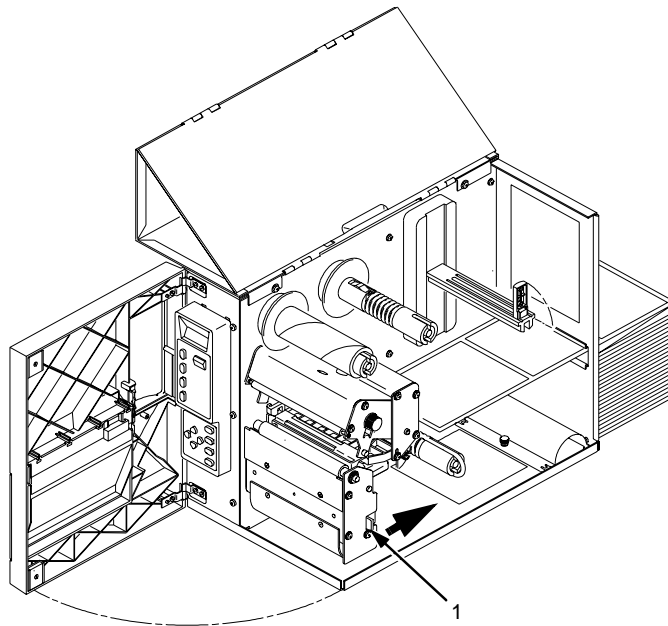
Legend:

1) Printhead Assembly Release Lever

5. Slide the media width adjustment tab to the outside stop of the media sensor assembly and rotate the tab up.
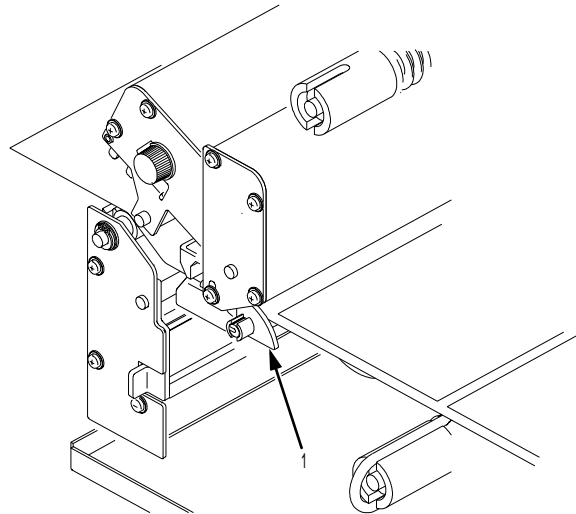
Legend:

1) Media Width Adjustment Tab

6. Thread the media through the media sensor assembly and then between the platen (drive roller) and the printhead.
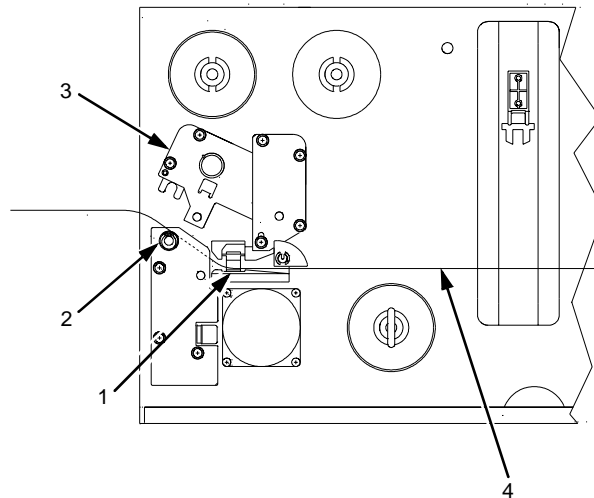
Legend:

1) Media Sensor Assembly
2) Platen
3) Printhead
4) Fanfold Media

7. Rotate the media width adjustment tab down and slide it over until it is flush with the fanfold media. Check the location of the media sensor, and refer to "Sensor Assembly Horizontal Adjustment" on page 47.
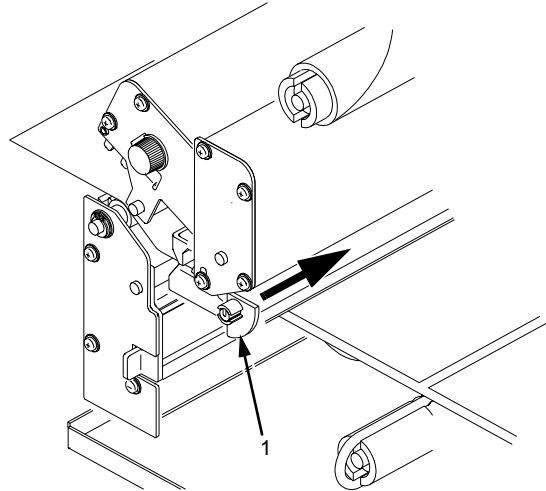
Legend:

1) Media Width Adjustment Tab

8. Close the printhead by pressing down on both sides of the front of the printhead assembly.

9. Adjust the label pressure control knob to match the width of the label stock in use.

Label Width	Pressure Control Knob Settings
2 inches or Less	2 inches
Greater Than 2 inches	4 inches

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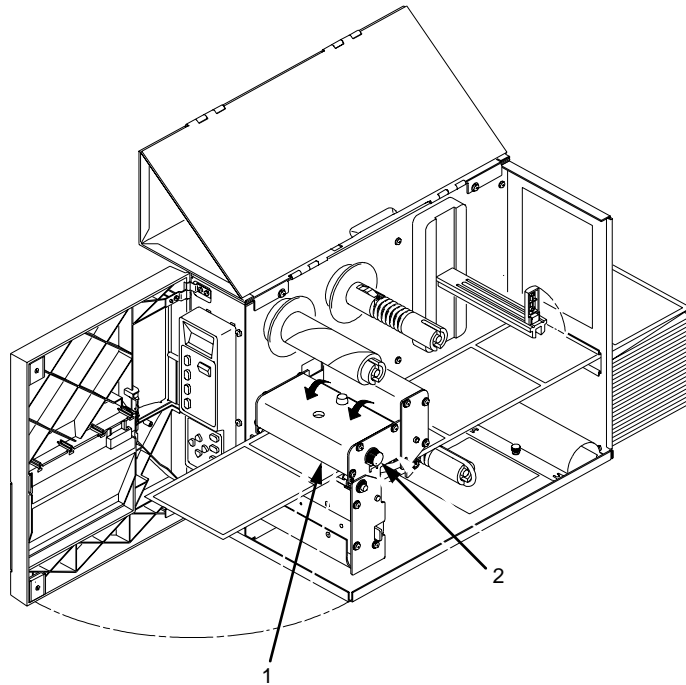
Legend:

1) Printhead Assembly
2) Label Pressure Control Knob

CAUTION   **Ensure the printhead is down and latched before attempting to print. Failure to do so may cause a premature failure of the printhead.**

10. Press the FEED key once to verify that the labels advance.

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 38. The Print Mode submenu is located in the PRINTER CONTROL Main Configuration menu. See "Printer Control Menu" on page 91 for more information. Close the printer's front door and top (and side) cover if the rewind or thermal transfer options are not needed.

11. Press the PAUSE key to place the printer online.

The printer is now ready for printing.

IMPORTANT   **The printer will not automatically detect a fault condition when the printhead is open. When using Transmissive or Reflective media, if the printhead assembly is opened and media is moved, repositioned, or replaced, the FEED key must be pressed after the printhead is locked for media to advance to the Top-of-Form position.**

Loading Ribbon

Skip this section when using Direct Thermal Media.

1. Slide the appropriate thermal transfer ribbon roll onto the ribbon supply spindle and open the Printhead assembly by pushing the release lever towards the back of the printer.
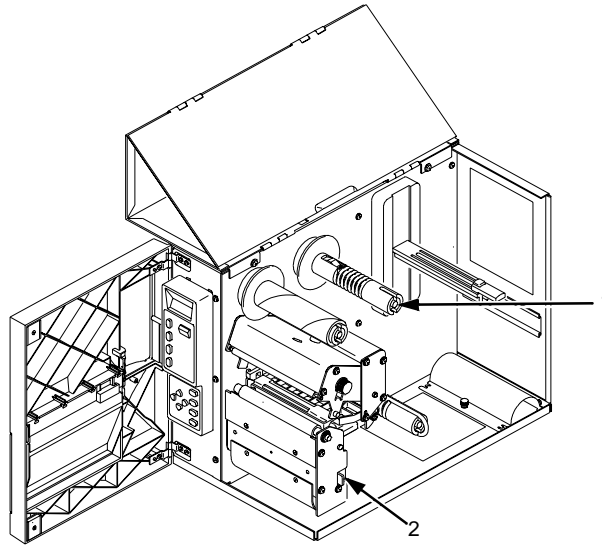
Legend:

1) Ribbon Supply Spindle
2) Printhead Assembly Release Lever

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2. Thread the transfer ribbon between the label sensor assembly and the printhead bracket. Continue threading the ribbon between the platen (and label stock, if loaded) and the printhead.

   For easy ribbon threading, slide half of the ribbon between the side of the label sensor assembly and the printhead bracket. Guide it from the side of the printer through the ribbon path.
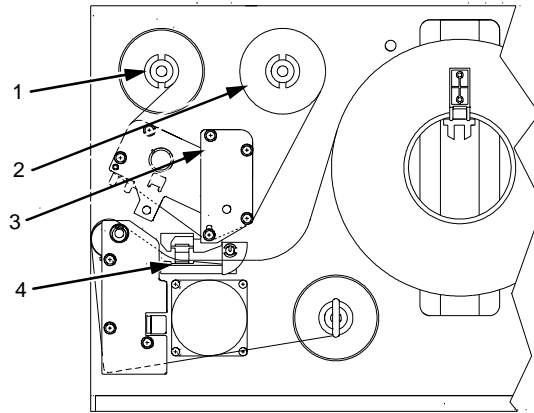
Legend:

1) Ribbon Take-up Spindle
2) Ribbon Supply Roll
3) Printhead Bracket
4) Label Sensor Assembly

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

   When installing a new roll of Printronix ribbon, fold the ribbon just behind the adhesive strip and attach the strip to the ribbon take-up core. Manually rotate the spindle counterclockwise to feed the unusable portion of the ribbon leader around the take-up spindle.
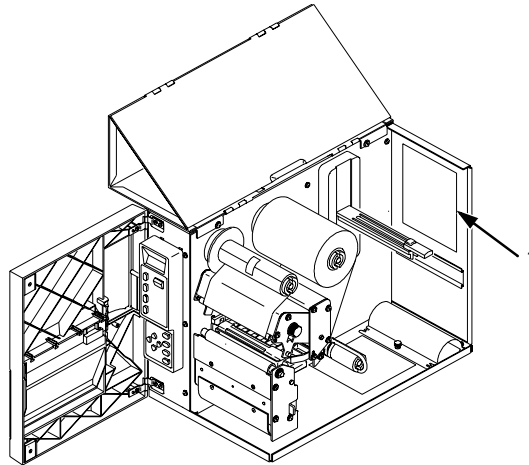
Legend:

1) Label and Ribbon Loading Diagram

4. Close the printhead by pressing down on both sides of the front of the printhead assembly.

5. Close the printer's front door and top (and side) cover if the label rewinder is not needed.

6. Verify that Print Mode is set for Transfer in the Printer Configuration Menu. The Print Mode submenu is located in the PRINTER CONTROL Main Configuration menu. See "Printer Control Menu" on page 91 for more information.

7. The printer is now ready for Thermal Transfer Printing.

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Label Rewinding

The printer can be set up to automatically rewind labels into a roll by using the label rewinder.

1. Remove the front door insert cover from the front door by sliding the insert cover up to unlock it, then pushing it out of the front of the door assembly.
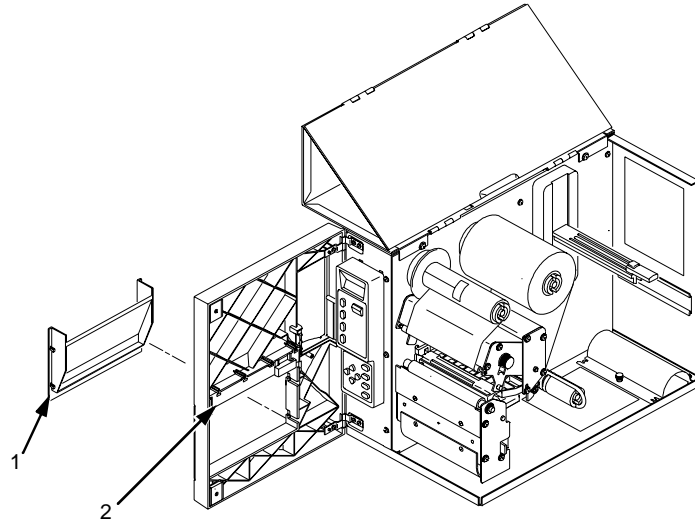
Legend:

1) Front Door Insert Cover
2) Label Taken Sensor Gate

2. Remove the label rewinder bracket from inside the printer. Turn the thumb screw holding the bracket to the printer chassis counter-clockwise to loosen. The screw is used for mounting and storing the bracket.
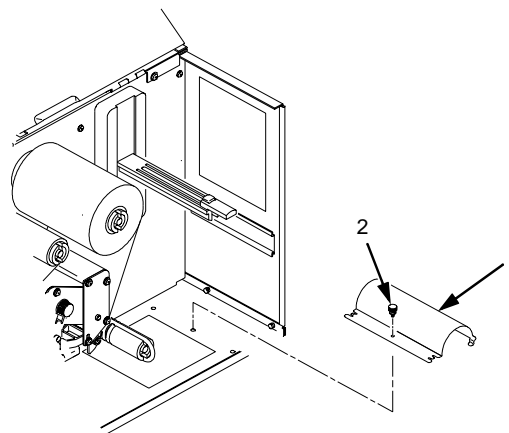
Legend:

1) Label Rewinder Bracket
2) Thumbscrew

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3. Hook the two stepped tabs of the label rewind bracket onto the two notches on the top edge of the platen roller assembly's tear-bar plate. Swing the bracket down. Align the bracket's tabs with the platen's bracket reference holes and insert them.

4. Secure the bracket with the thumb screw.

5. Remove the label rewind clip from the label rewinder spindle.
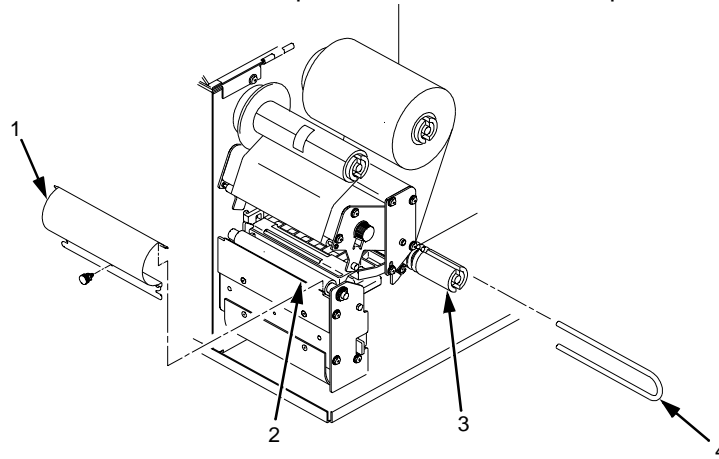
Legend:

1) Label Rewind Bracket
2) Platen Roller Tear Bar Plate
3) Label Rewinder Spindle
4) Label Rewind Clip

6. With the label stock already loaded and the front door open (To load labels see "Loading Roll Media" on page 29), thread the label stock around and below the platen roller assembly.

7. Press the FEED key with the printhead closed, as needed, to supply more label stock or liner.
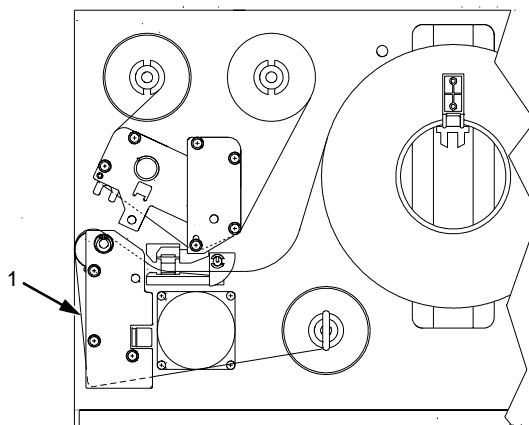
Legend:

1) Label Stock/Liner

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8. If a label is on the end of the label liner, remove it.

    a. Thread the liner around the label rewinder spindle counter-clockwise, as shown.

    b. Slide the label rewind clip over the label liner end and onto the label rewinder spindle.

    c. Fold the label liner over the clip to the back of the printer. This helps lock in the liner.

    d. Press the FEED key until the label liner is taut.
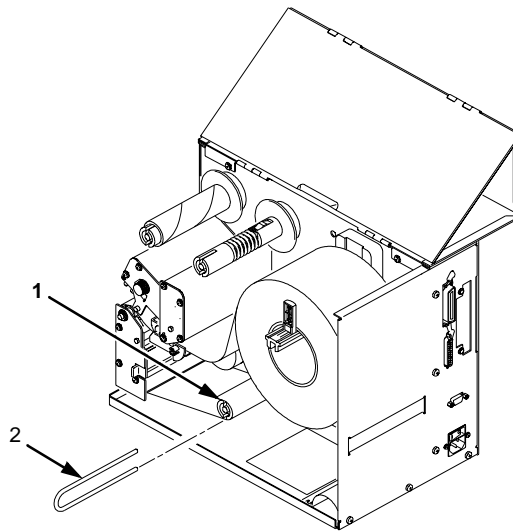
Legend:

1) Label Rewinder Spindle
2) Label Rewind Clip

9. To rewind labels, set Media Handling to Continuous in the configuration menu. The Media Handling submenu is located in the PRINTER CONTROL Main Configuration menu. See Chapter 3 for more information on configuring the printer.

10. Close the printer's front door and top (and side) cover.

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Label Peel Off

The printer can be set to automatically peel off labels from the backing liner and dispense them one at a time while rewinding the liner. This configuration requires use of the printer's label rewinder.

1. Remove the front door insert cover from the front door of the printer. Slide the insert cover up to unlock it, then push it out of the front of the door assembly.

2. For Peel-Off mode, flip the label taken sensor gate down.

3. If the label rewinder bracket is mounted on the platen tear bar assembly at the front of the printer, remove it and secure it in the stored position as shown.
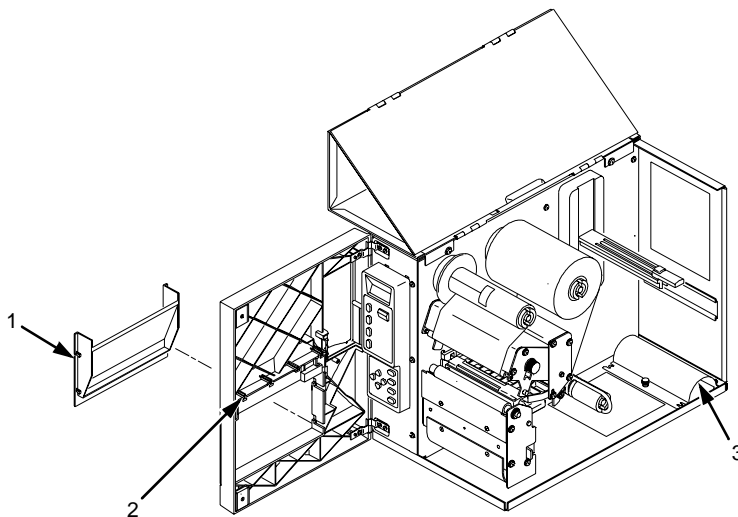
Legend:

1) Front Door Insert Cover
2) Label Taken Sensor Gate
3) Label Rewind Bracket

4. With the label stock already loaded and the front door open (To load labels, see "Loading Roll Media" on page 29) thread the label liner around and below the platen roller assembly.

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5. Press the FEED key with the printhead closed, as needed, to supply more label stock or liner.

6. If a label is on the end of the label liner, remove it.

7. Thread the liner around the label rewinder spindle counter-clockwise, as shown. Slide the label rewind clip over the label liner end and onto the label rewinder spindle.
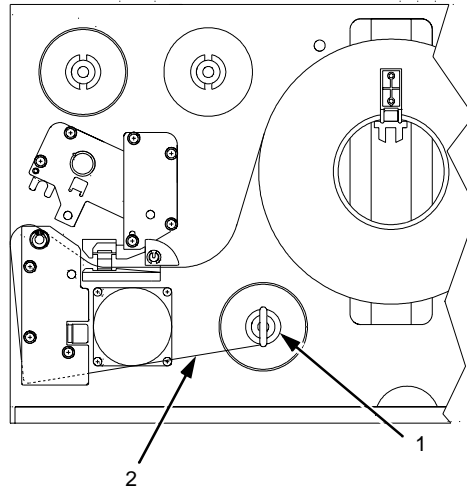
Legend:

1) Label Rewinder Spindle
2) Label Liner

8. Fold the label liner over the clip to the back of the printer. This helps lock in the liner.
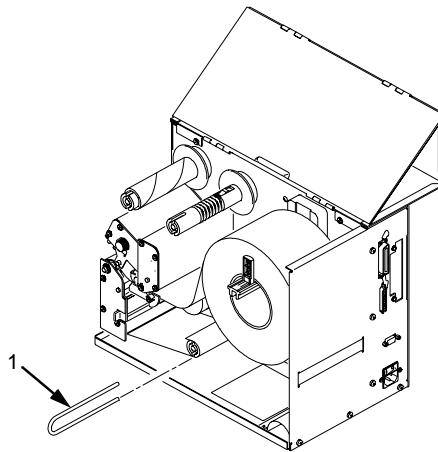
Legend:

1) Label Rewind Clip

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9. Press the FEED key until the label liner is taut.

10. For automatic label peel-off mode, set Media Handling to Peel-Off in the configuration menu. The Media Handling submenu is located in the PRINTER CONTROL Main Configuration menu. See Chapter 3 for more information on configuring the printer.

Peel-Off Mode
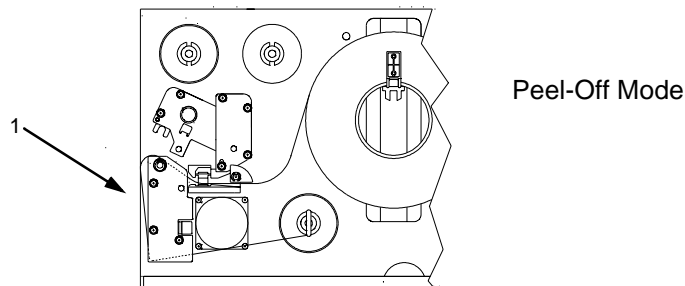
Close the printer's front door and top (and side) cover.

Legend:

1) Peeled Label Area

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

12. Press the FEED key. A label should advance to the peel-off position under the label taken sensor gate and "LABEL PRESENT Remove Label" should be displayed.

NOTE: While printing a print job, do not press the FEED key with the 'LABEL PRESENT Remove Label' message displayed or the message will be removed until the PAUSE key is pressed. Also, each pressing of the FEED key will cause a blank label to be added at the end of the print job.

13. Remove the label. "ONLINE" should then be displayed.

NOTE: A problem where labels drop back down onto the liner before they can be manually removed can occur, causing the label taken sensor to falsely sense the label was removed. Labels of 1.0 to 1.5 inches long are more likely to demonstrate this condition.

This problem can be resolved by decreasing Print Speed or Setting Paper Feed Shift (under the PRINTER CONTROL menu) from 0.00 inches to a negative (-) 0.07 to 0.10 inch value to retract the label back slightly keeping it in the horizontal position under the sensor.

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Label Variations And The Label Sensor

Your T4204 is equipped with a transmissive sensor that detects the gap between labels while they are being printed. The trailing edge of the gap establishes the Top-of-Form position. This feature depends on the ability of the sensor to "see through" the label liner, index hole or notch in the media. In order to support this type of media, select the Transmissive option under the PRINTER CONTROL Media Sensor menu. The Transmission Media Sensor Assembly must be partitioned correctly. (See Sensor Assembly Horizontal Adjustment, below.)

A reflective sensor located on the lower portion of the same sensor assembly detects a black horizontal stripe on media with reflective label backing. The trailing edge of the black stripe establishes the Top-of-Form position. This feature depends on the ability of the sensor to detect the difference in the amount of light reflected off the back of the label material and the black stripe. Select the Reflective option under the PRINTER CONTROL Media Sensor menu in order to support this type of media. Additionally, the Reflector Sensor must be in the correct horizontal position.

Sensor Assembly Horizontal Adjustment

In order to accurately detect the gap, hole, notch, or narrow black stripe, the transmissive sensor assembly can be moved 1.4 inches along the width of the media by squeezing together the two blue locking tabs, located under the label guide, and sliding the sensor to the desired position. The actual location of the transmissive sensor is indicated by the sensor crystal visible at the front of the label guide when the printhead assembly is open.

Position the transmissive sensor directly under the hole or notch. If it extends the full width of the media, position it in the middle of the transmission liner gap.

The reflective sensor is located directly below R2, the resistor farthest to the right on the sensor PCBA. The resistor is visible when the printhead is open. The reflective sensor should be positioned as close as possible in the middle of the width of the label black stripe.

When you use either Transmissive or Reflective Media sensing, adhere to the media specifications described in Appendix A and ensure that the Page Length value set in the PRINTER CONTROL Main Menu of the Configuration Menu (or Page Length value sent via software command) matches the physical length of the label or tag stock installed in the printer. In addition, do the sensor calibration procedure described below whenever a different type of media sensing will be required (Transmissive or Reflective), when installing untried media, or when the printer is losing Top-of-Form position. Loss of Top-of-Form is usually followed by an error message on the LCD, such as "GAP NOT DETECTED Check Media" or "LOAD PAPER".

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Calibrating The Transmissive And Reflective Sensors

Due to manufacturing differences in transmissive and reflective label stock, the sensors may have difficulty distinguishing between the label and the liner (gap) or the label and the black mark. When this occurs, the printer will display an error message on the LCD such as "GAP NOT DETECTED Check Media" or "LOAD PAPER". The printer's sensitivity for detecting the TOF (Top-Of-Form) position of the media installed can be optimized by using the Calibrate features in the PRINTER CONTROL menu.

Sensor sensitivity can be improved by changing the Refl Value for reflective media or by changing the Trans Value for transmissive media. These values can be changed manually within the PRINTER CONTROL menu or can be determined automatically by using the Run Calibrate procedure. The change in values (derived automatically or manually) takes effect immediately within the current configuration menu, but is not automatically saved. If Run 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 cannot be saved into memory and will be lost when the printer is powered off.

Use the Run Calibrate procedure to automatically determine the Trans or Refl Values before attempting to change the values manually. When Run Calibrate has completed successfully, the Sensed Distance option in the Calibrate 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 trailing edge of one black stripe to the trailing edge of the next black stripe.

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

If Run Calibrate fails to determine the proper values and ends with a fault message displayed (GAP NOT DETECTED or LOAD PAPER), you can try it again by going back to Run Calibrate under the PRINTER CONTROL main menu and then press the ENTER key. Or, you can manually change the Trans Value or the Refl Value. Trans Value and Refl Value have a range of 0 - 20 (factory default = 10).

Once the correct values are determined and the Page Length setting in the PRINTER CONTROL menu is equal to (or slightly less) than the physical page length, depress the FEED key to advance media and determine if it consistently stops at the correct TOF position each time.

Run Calibrate Procedure

NOTE: Verify that the media installed in the printer matches the PRINTER CONTROL menu Media Sensor option (Transmissive or Reflective).

Verify that the transmissive sensor is horizontally positioned to permit sensing of the notch, gap, or black stripe. (See "Sensor Assembly Horizontal Adjustment" on page 47.)

1. Press and release the PAUSE key to place the printer offline.

2. Open the printer front door to allow access to the Secondary Control Panel.

3. Press and release the UP and DOWN (▲ and ▼) keys simultaneously to unlock the printer menu. "ENTER SWITCH UNLOCKED" appears on the LCD.

4. Press the NEXT (▶) key until "PRINTER CONTROL" appears on the LCD.

5. Press the DOWN (▼) key. "Page Width" appears on the LCD.

6. Press the NEXT (▶) key until "Calibrate" appears.

7. Press the DOWN (▼) key. "Run Calibrate" appears.

8. Press the ENTER key. The media will advance a minimum of 11 inches plus the distance required to detect three additional Top-of-Form positions.

   The procedure is completed successfully if no fault is displayed and the Sensed Distance value is correct. See "Sensed Distance" on page 95 for a detailed description of Sensed Distance.

NOTE: If a fault message such as "GAP NOT DETECTED" or "LOAD PAPER" appears while performing the Run Calibrate procedure, press the CLEAR key and perform the Run Calibrate procedure again, by going back to Run Calibrate under the PRINTER CONTROL main menu and then press the ENTER key.

9. Press the UP (▲) key until "OFFLINE PRINTER CONTROL" appears on the LCD.

10. Press the FEED key. The media should advance one forms length.

NOTE: If the Page Length value is longer than the physical page length of the media in use, the printer will continue to advance media to achieve that Page Length value and then stop at the next TOF position.

11. 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 PRINTER CONTROL Main
> menu of the Configuration Menu. 'Tear-Off' and 'Tear-Off Strip' (after
> Tear-Strip Time) will advance the media until the Top-of-Form of the
> next form 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 form is positioned under the printhead.

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

Cleaning The Printhead

One cause of poor print quality is a dirty printhead. You should clean the
printhead whenever you replace the ribbon (thermal transfer mode) or install
new media (direct thermal mode).Clean the printhead with the printhead
Cleaning Pen supplied with the printer, or with Isopropyl alcohol and a cotton
swab.

1. Open the printhead assembly.

2. Pull back any rolled or fanfold media located directly under the printhead.
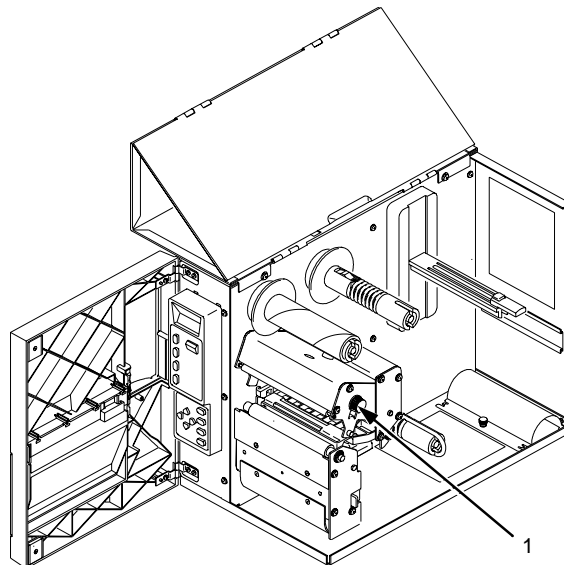
Legend:

1) Printhead Assembly

3. Gently rub the felt tip of the Cleaning Pen or a cotton swab with Isopropyl
alcohol across the amber area of the printhead.

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

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3 *Configuring The Printer*

Overview

Changing printer settings, such as print speed or emulation, is referred to as configuration. The configuration process is done using the secondary 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

The secondary control panel consists of four function keys and four arrow keys. Figure 1 shows the keypad section of the panel. An explanation of each key is in Table 1.

This section explains how to use the secondary control panel to change individual settings and save them as a customized configuration.

Legend:

1) UP Key
2) PREV Key
3) DOWN Key
4) CLEAR Key
5) PRT CONFIG Key
6) NEXT Key
7) JOB SELECT Key
8) ENTER Key
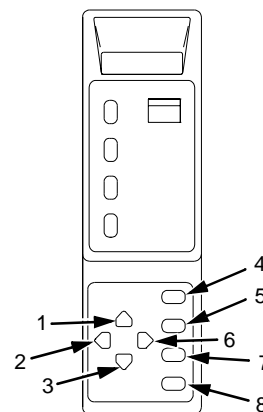
Figure 1. Secondary Control Panel

Table 1: Key Function Summary - Secondary Control Panel

Key	Function
CLEAR	If a fault condition exists, pressing this key clears the fault message and returns the printer to offline mode. **NOTE:** If the fault condition is not corrected before pressing CLEAR, the message reappears when attempting to place the printer online.
PRT CONFIG	Prints the current printer configuration menu settings (offline mode only).
JOB SELECT	Selects a specific printer configuration menu (offline mode only).
ENTER	Selects the current value within the printer configuration menu (offline mode only) and displays an asterisk (*) next to the value. If the 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 UP and DOWN keys at the same time unlocks the ENTER key and permits value selection.
UP (▲)	This key causes the printer to go up one level in the menu structure (offline mode only).
DOWN (▼)	This key causes the printer to go down one level in the menu structure (offline mode only).
PREV (◀)	If the menu selection is a value, pressing this key causes the value to be decremented. If the menu selection is an option, pressing this key allows selection among options on the current menu level. Holding the key down causes the key to repeat at about seven times a second (offline mode only).
NEXT (▶)	If the menu selection is a value, pressing this key causes the value to be incremented. If the menu selection is an option, pressing this key allows selection among options on the current menu level. Holding the key down causes the key to repeat at about seven times a second (offline mode only).
UP+DOWN (▲ + ▼)	Simultaneously pressing these keys unlocks or locks the printer menu (offline mode only). This is the default key combination for locking/unlocking the secondary control panel. You can change the key combination. See page 72.
NEXT+PREV (▶ + ◀)	Simultaneously pressing these keys enables a printer soft reset (offline mode only).

Using The Secondary Control Panel

Configuration parameters are set from the secondary 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 the main configuration menus and the corresponding submenus, where applicable.

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

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 and CONFIG. CONTROL appears on the next line.

Figure 2 shows the configuration main menu options. For details on the parameters that pertain to those options, refer to the specified pages.

Movement within the configuration menus is controlled by using the appropriate arrow keys. (See Table 1, for more details on the function of the operator panel keys.)

Figure 3 shows how to change a configuration menu option and the messages that appear in the display after you press each key.

If you follow the example shown in Figure 3, you will configure the printer for Direct Thermal Print Mode.

In this manual the factory default settings for all available options are indicated by an asterisk (*) located to the right of the option.

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

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.

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OFFLINE

CONFIG. CONTROL page 65	ACTIVE IGP EMUL page 67	EMULATION page 68	MAINT/MISC page 69	HOST INTERFACE page 77
Load Config.	IGP/PGL	LinePrinter+	Alarm	Twinax[1]
Save Config.	IGP/VGL	IGP/PGL	Power-Up State	Coax[1]
Print Config.		IGP/VGL	Hex Dump Mode	Auto Switching
Delete Config.		CTHI[1]	Ptx Setup Option	Centronics*
Power-Up Config.			Display Language	Serial
Protect Configs			Downloaded Fonts	IEEE 1284
Name Configs.			File System	Ethernet[1]
Reset Cfg Names			Cancel Key	
			Auto Locking	
			Set Lock Key	
			Auto Label Map	
			Compatibility	
			Power Saver Time	

ETHERNET PARAMS[1] page 90	PRINTER CONTROL page 91	FONT MEMORY page 97	DIAGNOSTICS page 100
IP Address	Page Width	Max Char Memory	Printer Tests
Gateway Address	Page Length	Max Cache Memory	System Memory
Subnet Mask	Print Speed	Max Cache Size	Print Statistics
MAC Address	Print Intensity	Max Cached Char	
Novell Protocol	Print Mode	Max Fonts Loaded	
NetBIOS Protocol	Media Sensor	Font Weight	
Novell Frame	Media Handling	Installed Fonts	
PPM Port Number	Paper Feed Shift		
PPM Port Timeout	Hor Image Shift		
	Ver Image Shift		
	Calibrate		
	Tear-Strip Time		
	Clip Page		
	Error Recover		

[1] if installed

Figure 2. Configuration Main Menu
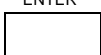
Step	Press	LCD	Notes
1.	PAUSE	OFFLINE CONFIG. CONTROL	
2.	+	ENTER SWITCH UNLOCKED	Allows you to make configuration changes.
3.	OR	OFFLINE PRINTER CONTROL	
4.		PRINTER CONTROL Page Width	
5.	UNTIL	PRINTER CONTROL Print Mode	
6.		Print Mode Transfer*	
7.	OR	Print Mode Direct	Cycle through the choices.
8.	ENTER	Print Mode Direct*	

Figure 3. Moving within the Configuration Menu

Selecting A Menu Option

By default, the ENTER key is "locked" when the printer is turned on. This prevents accidental changes to the configuration menu. If you press the ENTER 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 ENTER key, press the UP and DOWN arrow keys simultaneously. This toggles the enter lock function.

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

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

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NOTE: The lock and unlock function can be configured to be other than the UP and DOWN keys. (See "Set Lock Key" on page 72.)

IMPORTANT **This change takes effect for all subsequent data and operations for the printer only after the printer is placed in the Online mode. The configuration change(s) stay in effect only while the printer is powered on. When the power is turned off, all current configuration data are lost unless you save the configuration.**

To save configuration information permanently or to select it as the power-up default, see page 57.

Changing Printer Settings

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

   ```
   OFFLINE
   CONFIG CONTROL
   ```

2. Press ◀ or ▶ key for the following display.

   ```
   OFFLINE
   PRINTER CONTROL
   ```

3. Press the ▼ key for the following display:

   ```
   PRINTER CONTROL
   Page Width
   ```

4. Press ◀ or ▶ to cycle through these options:

   Page Width

   Page Length

   Print Speed

   Print Intensity

   Print Mode

   Media Sensor

   Media Handling

   Paper Feed Shift

   Hor Image Shift

   Ver Image Shift

   Calibrate

   Tear-Strip Time

   Clip Page

   Error Recover

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5. When the desired menu displays, press the ▼ key to access the available options or submenus.

6. Press the ◀ or ▶ key and hold to scroll through the values.

7. Press the ENTER key to select a value. An asterisk (*) displays next to the selected value.

8. If there are more values you want to change, use the ◀ ▶ ▲ ▼ (LEFT, RIGHT, UP, or DOWN) keys to access the value and the ENTER key to select it. At any time, you may press the ▲ key to return to the options one level higher.

9. At any time, you may press the PAUSE key to exit the configuration menu and place the printer online. Once you have finished selecting all your options, save your configuration.

IMPORTANT   **The printer must be placed in the Online mode before the new menu selections or changes take effect.**

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

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 RS-232 Serial Interface

Selects Page Width of 4 inches

Selects Page Length of 24 inches

Selects image Horizontal Shift of 0.20 inches, etc.

Config. 2:   Selects Parallel Interface

Selects Page Width of 2.2 inches

Selects Page Length of 25.0 mm

Selects image Vertical 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.

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Follow these steps to save a new configuration:

1. Press the PAUSE key to take the printer offline. The following message displays:

    > OFFLINE
    > CONFIG. CONTROL

2. Press the ▼ key until:

    > CONFIG CONTROL
    > Load Config.

3. Press the ◀ or ▶ key until the following displays:

    > CONFIG CONTROL
    > Save Config.

4. Press the ▼ key until:

    > Save Config.
    > 1*

5. Press the ◀ or ▶ key to cycle through the options (1-8). Note that the factory default configuration is not listed.

6. When the desired number displays, press ENTER to select it. The following message displays briefly:

    > Saving
    > Configuration

When processing is completed, the display shows:

> Save Config.
> *X**

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 page 59, step 4.

It is recommended that you print your configuration and store it in a safe place for future reference. Refer to page 60.

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 interface instead of the serial interface.

Config. 1:   Selects RS-232 Serial Interface
Selects Page Width of 4 inches
Selects Page Length of 24 inches
Selects Image Horizontal Shift of 0.20 inches, etc.

1. Load the configuration to be changed (for example, Config. 1).

    a. Press the PAUSE key to take the printer offline.

```
OFFLINE
CONFIG. CONTROL
```

    b. Press the ▼ key.

```
CONFIG. CONTROL
Load Config.
```

    c. Press the ▼ key.

```
Load Config.
1*
```

    d. Press the ◀ or ▶ key to cycle through the options: Factory 1-8.

    e. When the desired number displays, press the ENTER key to select it. The following message is displayed while loading.

```
Loading Saved
Configuration
```

Then, the following message displays when it is loaded:

```
Load Config.
X*
```

2. Move through the menu and change all the desired values. (In this example, under Host Interface, you would change the value from Serial to Centronics.)

3. Press the ENTER 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 ▲ key.

b. Press the ◀ or ▶ key until the following displays:

```
CONFIG. CONTROL
Delete Config.
```

c. Press the ▼ key.

d. Press the ◀ or ▶ key to cycle through the options (1-8). When the desired number displays, press the ENTER 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 page 57. 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 (see below) and store it in a safe place.

Printing A Configuration

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 4.

To print a configuration:

1. Press the PAUSE key to take the printer offline.

```
OFFLINE
CONFIG. CONTROL
```

2. Press the ▼ key for the following display:

```
CONFIG. CONTROL
Load Config.
```

3. Press the ◀ or ▶ key until the following displays:

```
CONFIG. CONTROL
Print Config.
```

4. Press the ▼ key.

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5. Press the ◀ or ▶ key to cycle through the following printout options:

Current*
Factory
Power-Up
All
1-8 customized configurations

6. When the desired option displays, press the ENTER key. The printer prints the specified configuration. Refer to Figure 4, for a sample configuration printout.

NOTE: If the configuration you want to print has not been saved, the following message will display momentarily:

```
CONFIG. DOES NOT
EXIST/Save First
```

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.

```
FACTORY CONFIGURATION
T4204 Printer Configuration
   Copyright (c) 1998-2000 by PRINTRONIX Inc.
   All rights reserved.
   Date 12-Jul-99
   Program File Version 1.03C Part No. 353787
   PGL/VGL Version 1.02C Part No. 353785
   LinePrinter+ Version 1.02C
   BOOT/T4204    V1.00K  20-May-99 #353459
   FLASH              4 MB
   DRAM               4 MB
   ACTIVE IGP EMUL                      IGP/PGL
   IGP/PGL
      Define CR Code                    CR = CR
      Define LF Code                    LF = LF
      Autowrap                          Disable
      Select SFCC                       126
      PI Slew Range                     16
      CR Edit                           Disable
      Select Font
         Standard Sets                  0) ASCII
      Slash 0                           Disable
      Autoeject                         Disable
      Select LPI                        6
      Auto Uppercase                    Disable
      Skip Cmd Prefix                   Enable
      Power on IGP/PGL                  Enable
      Ext Execute Copy                  Disable
      Barcode Options
         UPC Descenders                 Always
         Optimized Ratio                Disable
         I-2/5 Selection                Leading Zero
         AI 00 Spaces                   Disable
         Select SO Char                 14
      Host Form Length                  Enable
      PGL NORMAL                        LP+ Menu
      Do FF at TOF                      Enable
      IGP100 Compatbl.                  Disable
      Ignore Char
         Ignore Mode                    Disable
         Select Char                    0
      Error Report                      On
   LinePrinter+
      Printer Protocol
         P-Series
            Control Code 06             8.0 LPI
            Control Code 08             Elongated
            Define CR code              CR = CR
            Auto LF                     Disable
            Overstrike                  Enable
            Define LF code              LF = CR + LF
            Select SFCC                 1
            EVFU Select                 Enable
            Alt. Set 80-9F              Control Code
            Character Set
               Standard Sets
                  IBM PC
                     Primary Subset     ASCII (USA)
                     Extended Subset
                        Code Page 437   Set 1
            FF valid at TOF             Enable
      Orientation                       Portrait
      CPI/LPI Select
         Select CPI                     10.0 CPI
         Select LPI                     6.0 LPI
```

Figure 4. Sample Configuration Printout (sheet 1 of 3)

```
Font Attributes
    Typeface                    Letter Gothic
    Prop. Spacing               Enable
    Bold Print                  Disable
    Italic Print                Disable
    Slashed Zero                Disable
    Text Position               Bottom of Line
Plot Attributes
    Horizontal DPI              120 DPI
    Vertical DPI                72 DPI
Page Format
    Form Length
        Absolute Length         06.0 inch s
        Function of LPI         36 lines
    Form Width
        Absolute Width          04.1 inches
        Function of CPI         41 character
    Host Form Length            Disable
    Margins
        Logical Form
            Left Margin         0 characters
            Right Margin        0 characters
            Top Margin          0 linespaces
            Bottom Margin       0 linespaces
        Physical Page
            Left Margin         00.00 inches
            Right Margin        00.00 inches
            Top Margin          00.00 inches
            Bottom Margin       00.00 inches
    Perforation Skip            Disable
Print Char. Set
Reset Cmd CFG Ld                Disable
MAINT / MISC
    Alarm                       On
    Power-up State              Online
    Hex Dump Mode               Disable
    Ptx Setup Option
        Setup Parse             Enable
        Setup SFCC              21h
    Display Language            English
    File System
        Overwrite Files         Enable
        View File List
            93779.sf            147382 Bytes
            93952.sf            145350 Bytes
            91409.sf            47218 Bytes
            90993.sf            47856 Bytes
            92250.sf            59792 Bytes
            5719.sf             38605 Bytes
            5720.sf             62004 Bytes
            4938.sf             54868 Bytes
            4941.sf             27262 Bytes
            tmeca.fls           49742 Bytes
            version             61 Bytes
            network.dat         97 Bytes
            ptxLogo.gif         18788 Byte:
        Optimize&Reboot
        Print File List
    Cancel Key                  Disable
    Auto Locking                Disable
    Set Lock Key
    Auto Label Map
        Auto Map Select         Disable
        Auto Label Width        04.1 inches
        Num Auto Labels         2 labels
    Compatibility               Default
    Power Saver Time            15 minutes
```

Figure 4. Sample Configuration Printout (sheet 2 of 3)

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```
HOST INTERFACE
    Centronics
        Data Bit 8                    Enable
        PI Ignored                    Enable
        Data Polarity                 Standard
        Resp. Polarity                Standard
        Busy on Strobe                Enable
        Latch Data On                 Leading
        Prime Signal                  Enable
        TOF Action                    Reset
        Buffer Size in K              8
PRINTER CONTROL
    Page Width
        Width in Inches               04.1 inches
        Width in MM                   104.1 mm
    Page Length
        Length in Inches              06.0 inches
        Length in MM                  152.4 mm
    Print Speed                       6 ips
    Print Intensity                   10
    Print Mode                        Transfer
    Media Sensor                      None
    Media Handling                    Continuous
    Paper Feed Shift                  0.00 inches
    Hor Image Shift                   0.00 inches
    Ver Image Shift                   0.00 inches
    Calibrate
        Run Calibrate
        Refl Value                    10
        Trans Value                   10
        Sensed Distance               0.00 inches
    Tear-Strip Time                   1 seconds
    Clip Page                         Disable
    Error Recover                     Disable
FONT MEMORY
    Max Char Memory                   300 KBytes
    Max Cache Memory                  200 KBytes
    Max Cache Size                    900 Charact-rs
    Max Cached Char                   01 KBytes
    Max Fonts Loaded                  05 Fonts
    Font Weight
        Standard Chars.               205
        Bold Chars.                   260
        Extra Bold Char.              275
    Installed Fonts
        AGFA-93779
        AGFA-93952
        AGFA-91409
        AGFA-90993
        AGFA-92250
DIAGNOSTICS
    Printer Tests                     Checkerboard
    System Memory                     4 Megabytes
```

Figure 4. Sample Configuration Printout (sheet 3 of 3)

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Menu Options

The rest of this chapter shows each menu along with its possible choices, and explains what each of the choices mean.

CONFIG. CONTROL Menu

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

* = Factory Default

CONFIG. CONTROL (from page 54)					
Load Config.	Save Config.	Print Config.	Delete Config.	Power-up Config.	Protect Configs.
Factory* 1-8	1* (1-8)	Current* Factory Power-up All 1-8	1* (1-8)	Factory* 1-8	Disable* Enable

Name Configs	Reset Cfg Names
1* (1-8)	1* (1-8) All
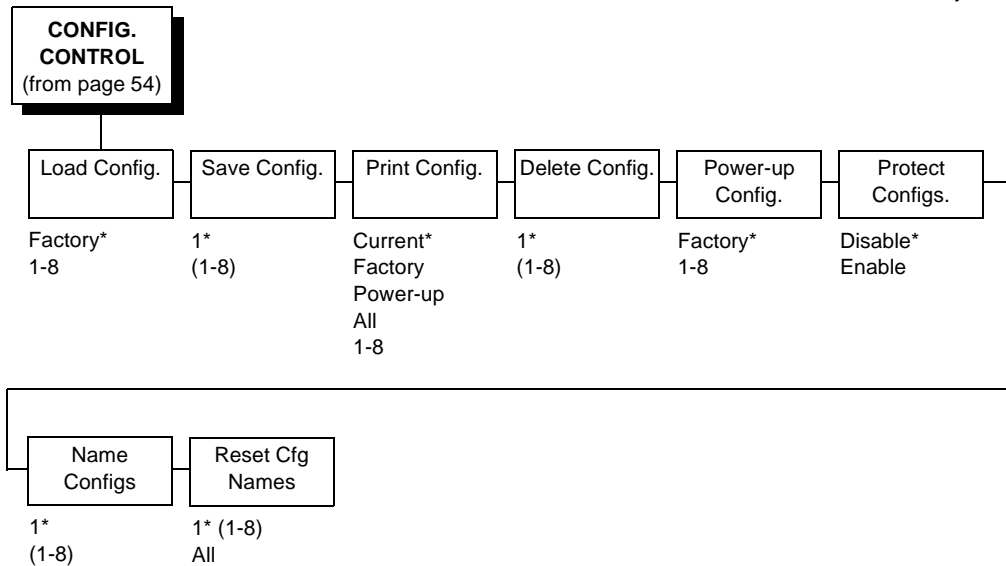
Load Config.

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

Save Config.

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 page 57 for details.

Print Config.

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.

Delete Config.

You can delete one or all of your eight customized configurations. The factory default configuration cannot be deleted.

Power-Up Config.

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

Protect Configs.

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.

Name Configs

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 ENTER key is pressed, which sets the modified name as the current selection.

Press the UP or DOWN (▲ or ▼) keys to cycle through the values available for that character at the cursor location. Press the NEXT (▶) key to move to the next character to be modified. Press the PREV (◀) 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 ENTER 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 ENTER key. The configuration name will revert to the last saved value.

Reset Cfg Names

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

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Active IGP EMUL Menu

**ACTIVE IGP
EMUL**
(from page 54)

IGP/PGL*
IGP/VGL

This ACTIVE IGP EMUL function allows the user to activate an installed IGP
VGL or PGL 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
Power-up configuration. Thus, any setting performed before selecting those
emulations 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 (Trans or Refl Values), Page 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.**

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Emulation Menu

The LinePrinter+ emulation is the standard emulation on the printer, along with a choice of IGP/PGL, or IGP/VGL. The CTHI emulation is available when the Coax/Twinax option is installed.

The contents of the emulation menu structure will be created by the printer at run-time, and, when powered up, the printer will automatically load the default configuration values. The default set of parameters is the factory setting until a new setting is saved to non-volatile memory.

NOTE: Each emulation may have a unique set of configuration options in addition to those that are in the printer system list. See the appropriate section at the end of this chapter for those settings.

```
              ┌──────────────┐
              │ EMULATION    │
              │ from page 54 │
              └──────┬───────┘
                     │
   ┌────────────┐  ┌─────────┐  ┌─────────┐
   │ LinePrinter+│──│ IGP/PGL │──│ IGP/VGL │──┐
   │ page 124   │  │ page 102│  │ page 112│  │
   └────────────┘  └─────────┘  └─────────┘  │
   ┌──────────────────────────────────────────┘
   │
   ┌─────────┐
   │ CTHI    │
   │ page 148│
   └─────────┘
```

MAINT / MISC Menu
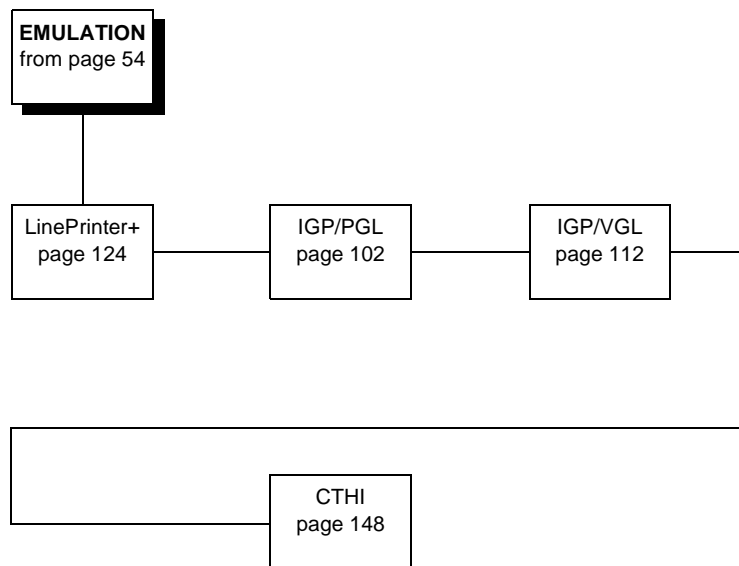
MAINT/MISC
(from page 54)

* = Factory Default
[1] If you have the CT option,
Enable is the default value,
otherwise it is Disable.
[2] If installed

Alarm	Power-up State	Hex Dump Mode	Ptx SETUP Option	Display Language

On*
Cont. Beep
Off
	Online*
	Offline
		Disable*
		Enable
			Setup Parse
			  Enable*
			  Disable
			Setup SFCC
			  21h*
			  (1h-FFh)
				English*
				German
				French
				Italian
				Spanish

File System	File System			

Overwrite Files
  Enable*
  Disable
View File List
  File 1
  File 2
  etc.
Delete Files
  File 1
  File 2
  etc.
Optimize&Reboot
Print File List				

Char. Operations	Ld Char at PwrUp	Set Operations	Ld Set at PwrUp
Delete frm Flash Load from Flash Save to Flash Delete from RAM	Disable* Enable	Delete frm Flash Load from Flash Save to Flash Delete from RAM	Disable* Enable

Cancel Key[1]	Auto Locking	Set Lock Key	Auto Label Map	Compatibility	Power Saver Time

Disable*
Enable
	Disable*
	Enable
			Auto Map Select
			  Disable*
			  Enable
			Auto Label Width
			  02.0 inches*
			  (00.1-04.1 inches)
			Num Auto Labels
			  2 labels*
			  (1-40 labels)
				Default*
				Laser
				P5000
				T3000
				T1006
					Disable
					1 minute
					5 minutes
					10 minutes
					15 minutes*
					30 minutes
					45 minutes
					60 minutes

Alarm

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

Power-Up State

- **Online.** The printer powers up in the online state.
- **Offline.** The printer powers up in the offline state.

Hex Dump Mode

A hex code printout (or hex dump) translates all incoming data to hexadecimal equivalents. A hex dump lists each ASCII data character received from the host computer, together with its corresponding two-digit hexadecimal code. Hex dumps can be used to troubleshoot some types of printer data reception problems. Hex Dump Mode is supported with a minimum media width of 4.10 inches.

NOTE: Narrower media will result in characters missing or truncated in the printout.

PTX SETUP Option

Selects the Special Function Control Code for the PTX SETUP command and functions.

- **Setup Parse.** Disables or enables the PTX SETUP command.
- **Setup SFCC.** Allows you to choose the hex value of the ASCII character you wish to use as the SFCC for the PTX SETUP command. Valid hex values are 01-FF. The default value is hex 21, which corresponds to the "!" character.

Display Language

This parameter chooses the language that will appear on the LCD: English, Spanish, French, Italian, or German.

Reset Cmd CFG Ld

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

- **Disable**. The active emulation parameters are loaded when the reset command is executed.
- **Power-Up Config**. The power-up configuration is loaded when the reset command is executed.

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- **Current Config**. The currently selected configuration is loaded when the reset command is executed.

- **Factory Config**. The factory installed configuration is loaded when the reset command is executed.

Downloaded Fonts

- **Char Operations**. Allows you to delete a character from flash, load a character from flash, save a character to flash, and delete a character from RAM.

- **Ld Char at PwrUp**. Allows you to disable or enable loading a character at power up.

- **Set Operations**. Allows you to delete a character set from flash, load a character from flash, save a character set to flash, and delete a character set from RAM.

- **Ld Set at PwrUp**. Allows you to disable or enable loading a character at power up.

File System

- **Overwrite Files.** Allows you to prevent files from being overwritten by disabling the overwrite function.

- **View File List.** Displays the list of files in the file system. Pressing the DOWN key displays the file size.

- **Delete Files**. Displays the list of files in the file system. Pressing the ENTER key deletes the file displayed on the front panel.

- **Optimize & Reboot**. Reclaims flash space from deleted flash files. After pressing ENTER, wait for the printer to reboot.

- **Print File List**. Prints a summary of the files stored in flash memory and several statistics on File System usage.

IMPORTANT   **Do not turn the printer off until it has completely rebooted and is either back online or offline.**

Cancel Key

When enabled, the CANCEL key may be used to clear all data in the print buffer without printing any of the data.

Auto Locking

- **Disable.** The ENTER key must be locked manually.

- **Enable.** The printer automatically locks the ENTER key five minutes after the last front panel key press.

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Set Lock Key

Normally, to lock or unlock the printer menu, the UP and DOWN 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 ENTER 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 configuration menu and select "Set Lock Key" (follow the menu structure on page 69).

2. Press ENTER. 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 "Verification 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.

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Auto Label Map

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 Printronix Wide Web line-matrix printers using Printronix 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.

Auto Map Select

- **Disable.** When a program is sent with horizontally adjacent labels that exceed the physical page width of the printer, the excess data will be clipped or wrapped based on the Autowrap menu option setting.

- **Enable.** 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 options (described below).

- **Auto Label Width.** 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 in 00.1 inch increments with a range of 00.1 inch through 04.1 inches. (See Note below).

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

- **Num Auto Labels.** The desired number of labels to be printed vertically adjacent on the form. The value is selectable with a range of 1 through 40 labels.

NOTE: Thr maximum number of labels is determined by the amount of memory in the printer and the width of the label. The maximum length is 47 inches using the maximum 4.09 inch print width. Reducing the print width extends the maximum print length.

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 inch labels for a printer with a physical width of 8 inches. The user now desires to use this file with a printer that has a 4 inch physical width.

Solution: The user sets Auto Label Width to 4 inches (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 inch label first. Once the first label has been completed, the printer will print the second 4 inch label. These labels will appear vertically adjacent on the form.

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Thermal Printer Output

Line-Matrix Printer Output

| Label 1 | Label 2 |

Wide Web Width

Label 1

Label 2

Narrow Web Width
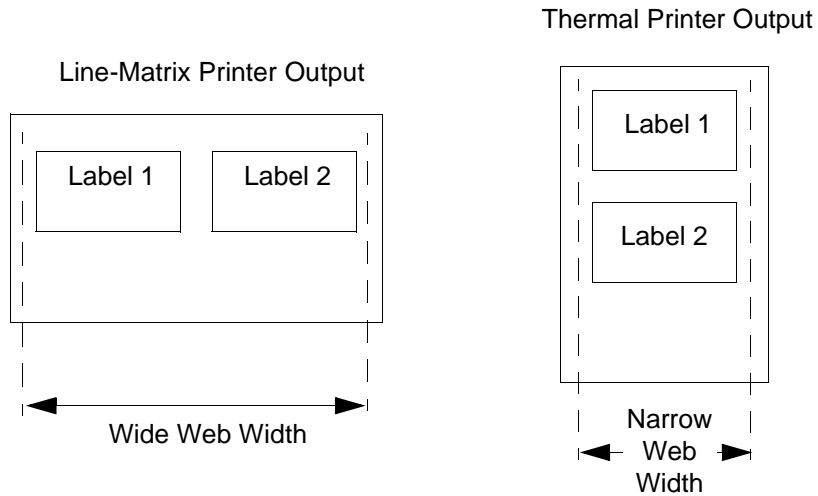
Example 2: Uneven Number Case

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

Solution #1: The user sets *Auto Label Width* to 4 inches (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 inch label along with a blank 2 inch label.

File Contents:

| Label 1 | Label 2 | Label 3 |

Print Output:

| Label 1 | Label 2 |
| Label 3 | Blank Label |

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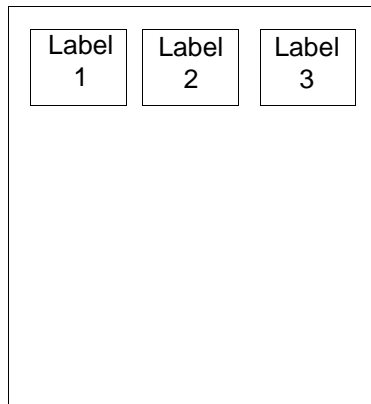
Solution #2: The user sets *Auto Label Width* to 2 inches, configures the *Num Auto Labels* to 3, and enables the Auto Label Mapping feature.

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

Label 1	Label 2	Label 3

Label 1
Label 2
Label 3
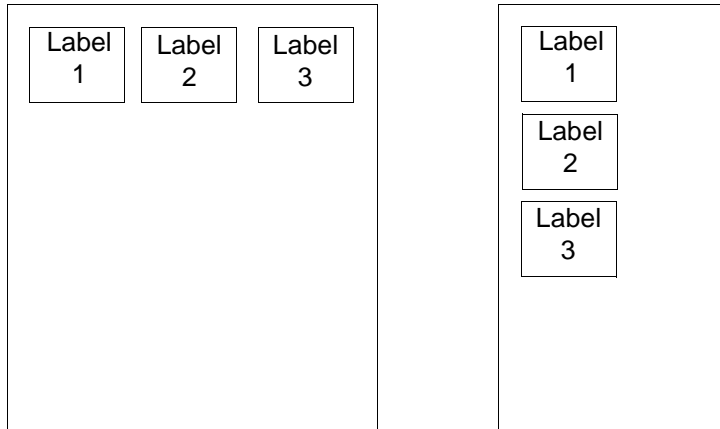
Example 3: Blank Label Case

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

Printer Operation: The maximum *Num Auto Labels* = (47 inches/4 inches) = 11. The selected value of 3 is legal. After the file is sent, the printer will begin by printing the first 4 inch width label. Once that label is complete, it will print the second 4 inch width label. Finally, once both of those labels have been printed, the printer will print a blank 4 inch label.

File Contents:

Print Output:

Label 1	Label 2

Label 1
Label 2
Blank Label

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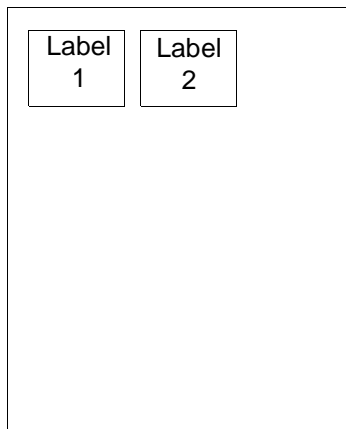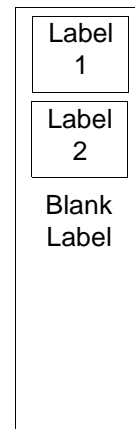
Compatibility

This parameter allows you to make the T4204 thermal printer 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.

Power Saver Time

The time interval you specify for this parameter sets the amount of idle time before the printer goes into Power Saver mode.

Idle time begins counting down once media motion ends.

- **Disable.** When Disable is chosen, the printer will not enter the Power Saver mode.
- **1 - 45 minutes.** You may set the Power Saver Time from as little as 1 minute to as long as 45 minutes.

HOST INTERFACE Menu

* = Factory Default
[1] Available when an Ethernet Adapter is present.

HOST INTERFACE (from page 54)

| Twinax | Coax | Auto Switching | Centronics* | Serial |

(Available with CT Option)   *(Available with CT Option)*   *(see page 80)*   *(see page 82)*

Parallel Hotport

Port Type
  Centronics*
  Dataproducts
  IEEE 1284
  Ethernet
  Disable
Trickle Time
  1/4 sec.*
  1/2 sec.
  1 sec.
  2 sec.
  4 sec.
  8 sec.
  16 sec.
  Off
Timeout
  10 sec.*
  (1-60)
Report Status
  Disable*
  Enable

Serial Hotport

Port Type
  RS-232*
  RS-422
  Disable
Trickle Time
  1/4 sec.*
  1/2 sec.
  1 sec.
  2 sec.
  4 sec.
  8 sec.
  16 sec.
  Off
Timeout
  10 sec.*
  (1-60)
Report Status
  Disable*
  Enable

C/T Hotport[1]

Port Type
  Twinax*
  Coax
  Disable
Timeout
  10 sec.*
  (1-60)
Report Status
  Disable*
  Enable

| IEEE 1284 | Ethernet[1] |

(see page 88)   *(see page 89)*

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The Host Interface Menu enables you to select and configure one of many types of interfaces between the printer and your host computer. The currently selected interface is indicated with an asterisk on the control panel message display. Each interface has its own submenu with a set of interface parameters which can be configured.

IMPORTANT **When switching between Twinax, Coax, or Auto Switching, the printer will load the power-up configuration. Any settings made and not saved before selecting these interfaces are lost.**

Auto Switching

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.

Port Type

Select the types of parallel, serial and/or C/T interfaces which are connected to the printer. For example, if your printer is attached to one host with a Centronics connection and a second host with an RS-422 serial connection, you would select Centronics under the Parallel Hotport menu, RS-422 under the Serial Hotport menu, and Disable under the C/T Hotport menu.

Trickle Time

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.

Timeout

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.

Report Status

- **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.

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Centronics (Parallel)

* = Factory Default

```
┌─────────────┐
│ CENTRONICS  │
│(from page 54)│
└─────────────┘
```

Data Bit 8	PI Ignored	Data Polarity	Resp. Polarity	Busy On Strobe	Latch Data On
Enable*	Enable*	Standard*	Standard*	Enable*	Leading*
Disable	Disable	Inverted	Inverted	Disable	Trailing

Prime Signal	TOF Action	Buffer Size In K
Enable*	Reset*	8*
Disable	Do Nothing	1-16
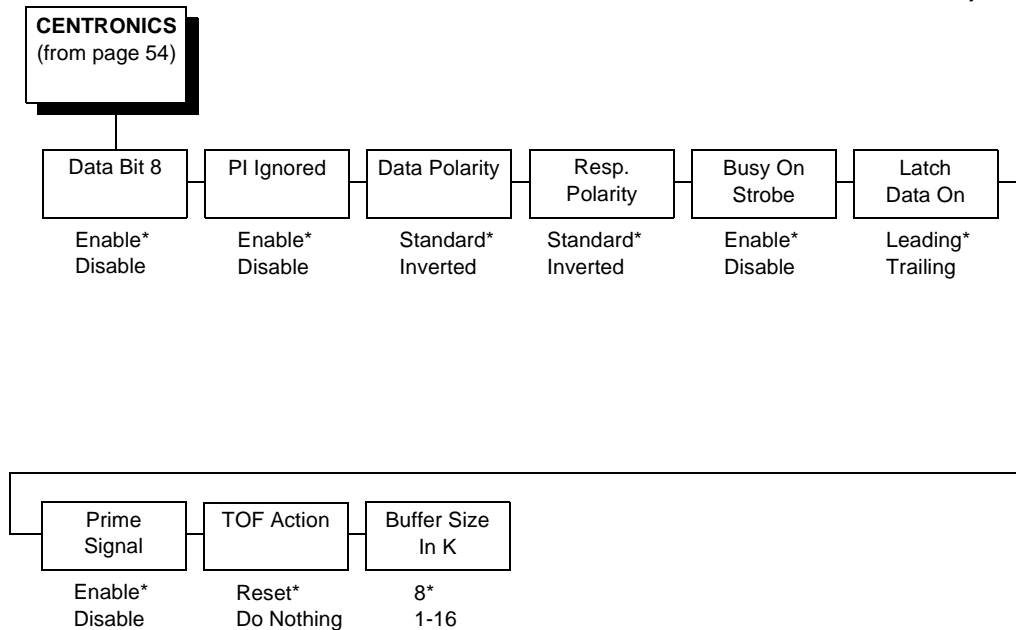
Data Bit 8

- **Enable**. Allows access to the extended ASCII character set.
- **Disable**. The printer interprets bit 8 of each incoming data character as a zero, regardless of its actual setting.

PI Ignored

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.

Data Polarity

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.

Response Polarity

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.

Busy On Strobe

*   **Enable**. Asserts a busy signal after each character is received.

*   **Disable**. Asserts a busy signal only when the print buffers are full.

Latch Data On

Specifies whether the data is read on the leading or trailing edge of the data strobe signal.

Prime Signal

*   **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.

TOF Action

*   **Reset**. A form feed is performed before a warm start when the prime signal is asserted from the host. This setting is used only if the Prime Signal parameter is enabled.

*   **Do Nothing**. Nothing occurs before a warm start when the prime signal is asserted from the host.

Buffer Size In K

Configures the amount of memory allocated for the Centronics parallel port buffer. You can specify between 1 and 16 Kbytes, in 1-Kbyte increments.

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Serial

* = Factory Default

```
┌─────────────┐
│   SERIAL    │
│(from page 54)│
└─────────────┘
```

Interface Type	Data Protocol	Baud Rate	Word Length	Stop Bits	Parity
RS-232*	XON/XOFF*	600	8 bits*	1 stop bit*	None*
RS-422	ETX/ACK	1200	7 bits	2 stop bits	Odd
	ACK/NAK	2400			Even
	Series 1 Char	4800			Mark
	Series 2 Char	9600*			Sense
	DTR	38400			
		57600			
		115200			

Data Terminal Ready	Request To Send	Buffer Size In K	Poll Character	Poll Response
True*	On-Line and BNF*	1*	00 Hex*	0 ms*
On-Line and BNF	Off-Line or BF	(1-16)	(00-FF hex)	(0-30)
Off-Line or BF	On-Line			
On-Line	False			
False	True			

Idle Response	One Char Enquiry	Printer Status
Disable*	Disable*	Disable*
Enable	Enable	ENQ/STX
		ENQ

Interface Type

This parameter allows you to select either the RS-232 or RS-422 serial port interface.

Data Protocol

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.

- **SERIES1 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 00 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 in Table 2.

Table 2. Series1 1 Char Response Characters

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

- **SERIES1 2 CHAR.** This protocol behaves exactly the same as the Series1 Char except there is a two-character response to the host. The response characters are described in Table 3.

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Table 3. Series1 2 Char Response Characters

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.

Baud Rate

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.

Word Length

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.

Stop Bits

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.

Parity

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

Data Terminal Ready

This configuration is part of hardware flow control and determines when the Data Terminal Ready (DTR) signal is generated. This signal indicates 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.

Request to Send

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

- **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.

Buffer Size In K

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.

Poll Character

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.

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Poll Response

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.

Idle Response

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.

One Char Enquiry

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.

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Printer Status

Disabled - Printer status ignored.

ENQ and ENQ/STX

When enabled, the printer responds to an ENQ signal by sending a status byte to the host. The type of status byte is determined by a Front Panel menu selection. The selections allowed are ENQ and ENQ/STX. The ENQ is removed from the data stream. The menu selection for enabling the ENQ option may only be seen when using a feature file.

Bit	Printer Status
0	Set when the label has printed
1	Set when the label is presented
2	Set while printer is online.
3	Always set.
4	Set printing in the batch mode.
5	Set during a ribbon fault.
6	Set during a paper out fault.
7	Always set.

The ENQ/STX status byte is shown below:

Bit	Printer Status
0	Set when the printer is not online or the buffer is full.
1	Set when the printer is offline.
2	Clear during a paper out fault.
3	Always set.
4	Always set.
5	Set during a buffer overflow fault.
6	Set during a parity or framing error fault.
7	Always clear.

IEEE 1284 Parallel (Bidirectional)

* = Factory Default

```
        ┌──────────────┐
        │    HOST      │
        │  INTERFACE   │
        └──────────────┘
               │
        ┌──────────────┐
        │  IEEE 1284   │
        │(from page 77)│
        └──────────────┘
               │
   ┌───────────┬───────────────┐
┌──────────┐ ┌──────────┐ ┌──────────────┐
│Prime Signal│ │TOF Action│ │Buffer Size In│
│          │ │          │ │      K       │
└──────────┘ └──────────┘ └──────────────┘

Enable*      Reset*       1*
Disable      Do Nothing   (1-16)
```
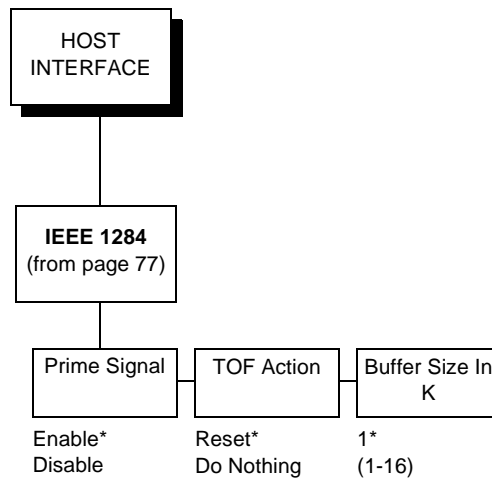
The IEEE 1284 interface is faster and more versatile than Centronics and supports bidirectional communication. Chapter 5 discusses the available modes (Compatibility, Nibble, and Byte) in more detail. Configuration of this interface is controlled from the host.

Prime Signal

• **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.

TOF Action

• **Reset.** A form feed is performed before a warm start when the prime signal is asserted from the host. This setting is used only if the Prime Signal parameter is enabled.

• **Do Nothing.** Nothing occurs before a warm start when the prime signal is asserted from the host.

Buffer Size In K

This option configures the amount of memory allocated for the IEEE 1284 parallel port buffer. You can specify between 1 and 16 Kbytes, in 1-Kbyte increments.

Ethernet

```
┌─────────────┐
│   HOST      │
│ INTERFACE   │
└─────────────┘
       │
       │
┌─────────────┐
│  Ethernet   │
│(from page 77)│
└─────────────┘
       │
       │
┌─────────────┐
│Buffer Size In│
│     K       │
└─────────────┘
     1*
    (1-16)
```
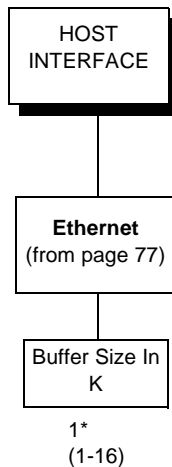
The Ethernet interface allows you to locate the printer on a LAN rather than attach the host directly into the printer. The detailed configuration of this option is given in the *PrintNet User's Manual.*

Buffer Size In K

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

ETHERNET PARAMETERS Menu

* = Factory Default

```
┌──────────────┐
│   ETHERNET   │
│    PARAMS    │
│ (from page 54)│
└──────────────┘
        │
```

IP Address	Gateway Address	Subnet Mask	MAC Address	Novell Protocol	NetBIOS Protocol
xxx.xxx.xxx.xxx	xxx.xxx.xxx.xxx	xxx.xxx.xxx.xxx	hhhhhhhhhhhh	Enable* Disable	Enable* Disable

Novell Frame	PPM Port Number	PPM Port Timeout
Auto Sensing* Ethernet II Ethernet 802.2 Ethernet 802.3 802.2 Snap	3001* (0-65535)	100 secs.* (1-255)
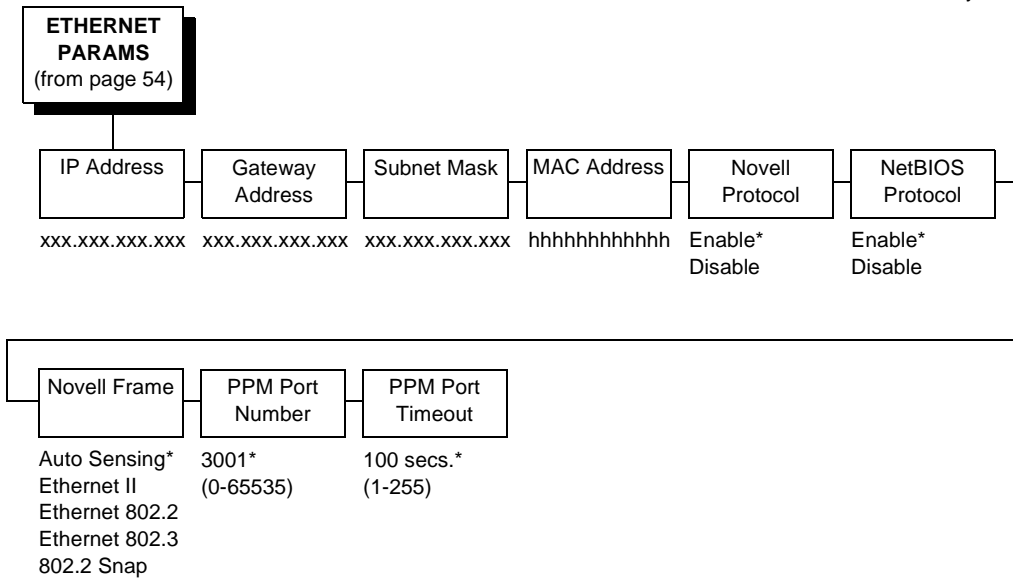
The ETHERNET PARAMS menu is available only when the Printronix PrintNet option is installed. This menu is for configuring your printer for network operation.

For information on assigning the IP Address, Gateway Address, Subnet Mask and MAC Address, refer to the *PrintNet User's Manual*.

You may also enable or disable the Novell or NetBIOS Protocols within this menu, as well as selecting which Novell Frame scheme is used in processing Novell signals. See the Novell chapter in the *PrintNet User's Manual* for more details.

If the printer is connected to a Printer Manager utility, the PPM Port number and PPM Port Timeout settings must match the settings in the Printer Manager program. See the appropriate *Printer Manager* manual for details.

Printer Control Menu

```
┌─────────────┐
│  PRINTER    │
│  CONTROL    │
│ from page 54│
└─────────────┘
```

Page Width	Page Length	Print Speed	Print Intensity

```
                                        2 inches          0
                                        3 inches          :
                                        4 inches         10*
                                        5 inches          :
                                        6 inches*        20
```

Width In Inches	Width in MM	Length in Inches	Length in MM

```
00.1 inches       2.5 mm        00.1 inches       2.5 mm
00.2 inches       2.6 mm            :                :
    :                :          06.0 inches*      152.4 mm*
04.1 inches*      104.1 mm*         :                :
                                99.0 inches       2514.6 mm*
```

Print Mode	Media Sensor	Media Handling	Paper Feed Shift	Hor Image Shift

```
Transfer*       None*          Continuous*      -0.50 inches    -1.00 inches
Direct          Reflective     Tear-Off Strip        :               :
                Transmissive   Tear-Off         0.00 inches*     0.00 inches*
                               Peel-Off              :               :
                               Cut              2.00 inches      1.00 inches
```

Ver Image Shift	Calibrate	Tear Strip Time	Clip Page	Error Recovery

```
-1.00 inches    Run Calibrate      1 second*      Enable*      Disable*
    :           Refl Value             :          Disable      Enable
0.00 inches*      10* (0-20)     60 seconds
    :           Trans Value
6.00 inches       10* (0-20)
                Sensed Distance
                  0.00 inches*
```

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Page Width

This option specifies the physical width of the image to be printed. The value can be specified in inches or millimeters. The allowable range in inches is 00.1 to the maximum print width of the printer 4.1 inches, in 00.1 inch increments. The allowable range in millimeters is 2.5 to 104.1 in 1-millimeter increments. The factory default value is 4.1 inches, or 104.1 millimeters.

Page Length

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

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

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

When continuous media with no transmissive gap, or black stripe is installed (no predetermined length) and the Media Sensor option = None, the user-selected Page Length under the PRINTER CONTROL menu will determine the length of the physical page.

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

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

The PRINTER CONTROL menu Page Length value will override and change the LinePrinter+ menu Absolute Form Length value.

If the LinePrinter +, PGL or VGL Host Form Length = Enabled in the configuration menu, then Host Form Length software commands will override and change the PRINTER CONTROL Page Length value. The sent Host Form Length value can be viewed under the Page Length option in the configuration menu.

If the Lineprinter +, PGL or VGL Host Form Length = Disable, then Host Form Length software commands will have no effect on the PRINTER CONTROL menu Page Length value.

The allowable Page Length range is 00.1 to 99.0 inches in 00.1 inch increments (2.5 - 2514.6mm) The factory default is 06.0 inches (152.4 mm).

Page Length range is limited to a maximum value of 47.0 inches (1193.8 mm) when Page Width is set to 4.1 inches. Decreasing (narrowing) the Page Width to 1.7 inches will extend the range limits of the Page Length and permit a longer Page Length selection (99.0 inches maximum).

Print Speed

This option specifies the speed at which the media passes through the printer. This parameter has a significant effect on print quality (see Print Intensity below).

Print Intensity

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.

Print Mode

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).

Media Sensor

This option specifies whether either of the label sensors (Reflective or Transmissive) are enabled.

None - Indicates that continuous media with no black strip and no transmissive gap is being used. Forms length is based on the Page Length value, located under the Printer Control Menu.

Reflective - Indicates media with a horizontal black mark on the back side of the liner is being used. The trailing edge of the black mark 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.

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Media Handling

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 or rewinds the printed media onto the internal rewinder. The label taken sensor gate should be in the up (disabled) position to support continuous.

- **Tear-Off Strip.** Prints until the print buffer is empty, then positions the last label over the tear-off bar for removal. The label taken sensor gate should be in the up (disabled) position to support tear-off strip.

- **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. The label taken sensor gate must be in the down (enabled) position to support tear-off.

- **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 label taken sensor gate must be in the down (enabled) position to support peel-off.

- **Cut.** When the optional media cutter is installed, it automatically cuts media after each label is printed or can cut after a specified number of labels have been printed using a software cut command. It cuts continuous roll paper, labels, or tag stock. The label taken sensor gate must be in the up (disabled) position to support cut.

Paper Feed Shift

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.

Hor Image Shift

This option specifies the amount to shift an image horizontally left (-) or right (+) for precise positioning on the page. 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.

Ver Image Shift

This option specifies the amount to shift an image vertically up (-) or down (+) for precise positioning on the page. 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.

Calibrate

This feature is used to optimize the sensitivity of the Transmissive or Reflective sensors (whichever is selected in the Media Sensor sub-menu) in being able to detect the TOF (Top-of-Form) position of the current media installed. The sensitivity can be adjusted manually by changing the Refl Value or Trans Value menu settings or can be determined automatically by using the Run Calibrate procedure.

The change in values (derived automatically or manually entered) take affect 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 Trans or Refl Values automatically determined by the Run Calibrate procedure before attempting to make any manual changes to the Values. If the Run Calibrate procedure fails to determine the proper values and ends with a fault message displayed ("GAP NOT DETECTED" or "LOAD PAPER"), you can manually enter the Refl Value or Trans Value and press the FEED key to determine if the gap or black stripe can be consistently detected.

- **Run Calibrate.** Pressing the ENTER key with 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 Refl Value or Trans Value (depending on which media type is installed) and the Sensed Distance value will be determined automatically.

- **Refl Value.** Value representing the sensitivity for distinguishing the difference between the black mark and label liner or tag stock for Reflective media. The value range is (0-20) and the default value is 10. This value can be determined automatically by using the Run Calibrate procedure or can be entered manually. Too high a value causes a "GAP NOT DETECTED" error message displayed, too low a value causes a "LOAD PAPER" error message.

- **Trans Value.** Value representing the sensitivity for distinguishing the difference between the label and the transmissive gap (hole, notch or label liner) for Transmissive media. The value range is (0-20) with a default of 10. This value can be determined automatically by using the Run Calibrate procedure or can be entered manually. Too high a value causes a "LOAD PAPER" error message displayed, too low a value causes a "GAP NOT DETECTED" message.

- **Sensed Distance.** 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. With Reflective media installed the distance equals the trailing edge of one black mark to the trailing edge of the next. The factory default for Sensed Distance is 0.00 inches. This value is automatically determined only after successful completion of the Run Calibrate procedure and cannot be changed manually.

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Tear-Strip Time

When using Tear-Off Strip media handling, the Tear-Strip Time 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.

Clip Page

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. The media sensor looks for the gap notch, hole, or black mark only after the label has advanced the distance specified by the Page Length value in the Printer Control menu, or by the host forms Length value sent via host software. Any gaps, holes, notches, or black marks that exist prior to reaching the Page Length or Host Forms Length value will be ignored.

- **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 media sensor will constantly look for the gap, notch, hole, or black mark, and when detected will use it as the Top-Of-Form Position for the next page and clip any excess data for the previous page.

Error Recovery

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.

Font Memory Menu

This option allows the user to set the amount of memory reserved for scalable font caching. The maximum amount of memory which can be selected is determined by the total amount of memory installed in the printer.

Font Memory from page 54				
Max Char Memory	Max Cache Memory	Max Cache Size	Max Cached Char	Max Fonts Loaded
50 KBytes	50 KBytes	50 Characters	1 Kbytes*	1 Font
100 KBytes	100 KBytes	100 Characters	2 Kbytes	2 Fonts
150 KBytes	150 KBytes	150 Characters	3 Kbytes	3 Fonts
200 KBytes	200 KBytes*	200 Characters	4 Kbytes	4 Fonts
250 KBytes	250 KBytes	250 Characters	5 Kbytes	5 Fonts*
300 KBytes*	300 KBytes	300 Characters	6 Kbytes	6 Fonts
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
900 KBytes	900 KBytes	900 Characters*	20 Kbytes	20 Fonts

Font Weight			Installed Fonts
			Lists installed fonts
Standard Chars.	Bold Chars	Extra Bold Char.	
10	10	10	
11	11	11	
12	12	12	
.	.	.	
.	.	.	
205*	260*	275*	
.	.	.	
.	.	.	
290	290	290	

Figure 5. Font Memory Menu

Figure 5 shows the Font Memory menu options. These options are further described in the sections that follow.

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

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Activating Font Memory Options

After selecting any of the "Font Memory" options, perform the following steps to activate the new value:

1. Save your configuration changes. See the Config. Control menu option "Save Configuration" on page 57.

2. Change the power-up configuration to match the configuration you just saved. See the Config. Control menu option "Power-Up Config." on page 66.

3. Turn the printer power off and then on again.

Max Char Memory

The Maximum Character Memory option specifies the size of the largest character that can be printed. To calculate the memory requirement, use this equation:

$$\frac{\text{horizontal resolution} \times \text{vertical resolution} \times \text{character height (inches)} \times \text{character width (inches)}}{8}$$

For example, if an application requires a character that is 4 inches high by 2 inches wide, calculate the Maximum Character Memory value as follows:

$$\frac{203 \times 203 \times 4 \times 2}{8} = 41,209$$

Therefore, select a value that is equal to or greater than 41,209. The closest available value is 50 KBytes.

The allowable range is 50 KBytes through 900 KBytes, in 50 - KByte increments. The default value for this parameter is 300 KBytes.

Max Cache Memory

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:

$$\frac{\text{horizontal resolution} \times \text{vertical resolution} \times \text{average character height (inches)} \times \text{average character width (inches)} \times \text{\# of characters to be cached}}{8}$$

The allowable range is 50 KBytes through 900 KBytes, in 50-KByte increments. The default value for this parameter is 200 KBytes.

Max Cache Size

The Maximum Cache Size option specifies the maximum number of characters that can be stored in the font cache.

The allowable range is 50 through 900 characters, in 50-character increments. The default value for this parameter is 900 characters.

Max Cached Char

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:

$$\frac{\text{horizontal resolution} \times \text{vertical resolution} \times \text{character height (inches)} \times \text{character width (inches)}}{8}$$

For example, if an application requires the use of a character that is 1 inch high by 1 inch wide, calculate the Maximum Cached Characters value as follows:

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

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 default value for this parameter is 1 KByte.

Max Fonts Loaded

The Maximum Fonts Loaded option specifies the number of scalable font outlines that can be concurrently loaded into DRAM in the printer.

The allowable range is 1 through 20 fonts, in 1-font increments. The default value for this parameter is 5 fonts.

NOTE: The above calculations for Maximum Character Memory, Maximum Cache Memory, and Maximum Cached Characters assume the standard 203 dpi resolution.

Font Weight

The Font Weight option specifies the thickness or stroke weight of the text fonts. The allowable range is 10 to 290, in increments of 1. The default values define the stroke weight for Standard, Bold, and Extra Bold printing.

Installed Fonts

The Installed Fonts option provides a list of all fonts currently loaded into DRAM.

DIAGNOSTICS Menu

```
DIAGNOSTICS
(from page 54)
```

* = Factory Default
[1] If Ethernet adapter is present.

```
Printer Tests          System          Print Statistics
                       Memory
```

Checkerboard*   X Megabytes   On: X.X hrs.
Grey   Print: X.X hrs.
Grid   Print Inches
Current Config
Left Test
Right Test
E-net Test Page[1]
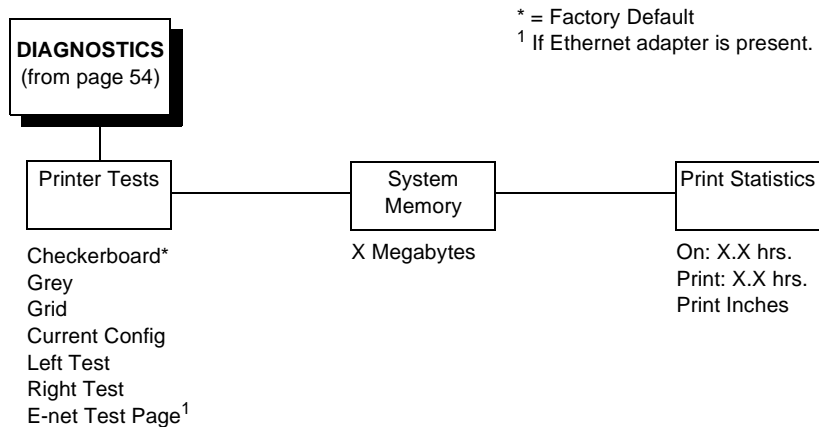
Printer Tests

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

NOTE: Your authorized service representative will typically run the tests.
They are described in more detail in the *Maintenance Manual*.

- **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 adapter (if present).

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System Memory

Displays the amount of DRAM installed.

Print Statistics

You can view various printer statistics and refer to them for preventive maintenance purposes. Printer statistics accumulate continuously; they do not reset when you turn off the printer. All of the printer statistics are set to zero at the factory after burn-in testing.

- **On.** The cumulative time in hours the printer has been powered on. The range is 0 to 30,000 hours.

- **Print.** The cumulative time in hours the printer has actually been printing. The range is 0 to 30,000 hours.

- **Print Inches.** The cumulative number of inches the printer has printed. The range is 0 to 2,147,483,647 print inches.

IGP/PGL Emulation

The PGL emulation is the software based Intelligent Graphics Printing (IGP) for the thermal family of Printronix printers. It is based upon, and is compatible with, the Printronix IGP-100/200/400 board using the Printronix Graphics Language (PGL). The IGP graphics processing features are detailed below.

IGP/PGL 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 user-selectable 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.

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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.

Configuring The Emulation With The Control Panel

You can select PGL default parameters directly from the control panel, or by control codes as explained in the *IGP/PGL Programmer's Reference Manual.* The PGL parameters are described on the following pages. Parameters marked with an asterisk (*) indicate the default value. The printer must be offline to enter the configuration structure.

Pressing an invalid key to enter a parameter value may move you to another level in the configuration or exit the configuration menu completely. Configure the IGP/PGL according to your specific requirements.

IMPORTANT   **BEFORE you reconfigure the IGP/PGL, print a configuration sheet to see all of the current settings.**

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IGP/PGL Submenu

* = Factory Default

```
┌─────────────┐
│  EMULATION  │
└─────────────┘
        │
┌─────────────┐
│   IGP/PGL   │
│ (from page 68) │
└─────────────┘
```

Define CR Code	Define LF Code	Autowrap	Select SFCC	PI Slew Range	CR Edit
CR = CR*	LF = LF*	Disable*	126*	16*	Disable*
CR = CR + LF	LF = CR + LF	Enable	(1-255)	15	Enable

Select Font	Slash 0	Autoeject	Select LPI	Auto Uppercase	Skip Cmd Prefix
(see page 111)	Disable*	Disable*	6*	Disable*	Enable*
	Enable	Enable	8, 9, 10	Enable	Disable

Power On IGP/PGL	Ext Execute Copy	Barcode Options	Host Form Length	PGL Normal	Do FF at TOF
Enable*	Disable*	*(see page 108)*	Disable*	LP+ Menu*	
Disable	Enable		Enable	PGL Menu	

IGP 100 Compatbl.	Ignore Char	Error Report
Disable*		On*
Enable		Debug Mode
		Fault
		Off

Ignore Mode	Select Char
Disable*	0*
Enable	(0-255)

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Define CR Code (Carriage Return)

This parameter forces the printer to insert an automatic Line Feed code into the data stream whenever a Carriage Return code occurs. This is to be used only if the host computer does not send Line Feeds to the printer.

• **CR = CR.** Does not perform a line feed. The next print position will be print position 1 of the current line.

• **CR = CR + LF.** Performs an automatic line feed. The next print position will be print position 1 of the next line.

Define LF Code (Line Feed)

This parameter forces the printer to insert an automatic Carriage Return code into the data stream whenever a Line Feed code occurs. This can be used in most installations, but it is required if the host computer does not send Carriage Returns to the printer.

• **LF = LF.** Does not perform an automatic carriage return. The next print position will be the current print position of the next line.

• **LF = CR + LF.** Performs an automatic carriage return. The next print position will be print position 1 of the next line.

Autowrap

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.

Select SFCC

You can specify which dec code (1-255) will be used as the Special Function Control Code (SFCC). The factory default setting is 126. The SFCC denotes that the following data is a PGL command.

PI Slew Range

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.

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CR Edit

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.

Select Font

Select Font specifies which language is currently selected for use with the PGL. Refer to page 111 for available selections.

Slash 0

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.

Autoeject

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.

Select LPI

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.

Auto Uppercase

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.

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Skip Command Prefix

This parameter determines if the printer will print any data before a PGL command is received.

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

Power On IGP/PGL

You can set the IGP feature so that it is enabled or disabled when the printer is powered on.

- **Enable.** The PGL is enabled when the printer is powered on. (The PGL feature is initialized in the Normal mode.)
- **Disable.** The PGL is disabled when the printer is powered on. (The PGL feature is initialized to the Quiet mode.)

Extended Execute Copy

- **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 in which the Form Count parameter is specified in the Execute command. In this case, the exact same form (with identical dynamic data) is printed for whatever the Form Count is. However, incremental data is not incremented since the page that is printing is exactly the same, the overlay data is only printed with the first form and not subsequent forms, and each form is printed on a separate page.

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Barcode Options

* = Factory Default

```
┌──────────────┐
│   Barcode    │
│   Options    │
│ (from page 104)│
└──────────────┘
        │
   ┌────┼────────┬────────────┬───────────┬──────────┐
┌──────┐ ┌──────────┐ ┌──────────────┐ ┌──────────┐ ┌──────────┐
│ UPC  │ │Optimized │ │I-2/5 Selection│ │AI 00 Spaces│ │Select SO │
│Descenders│ │ Ratio  │ │              │ │          │ │  Char    │
└──────┘ └──────────┘ └──────────────┘ └──────────┘ └──────────┘
```

UPC Descenders	Optimized Ratio	I-2/5 Selection	AI 00 Spaces	Select SO Char
Always*	Disable*	Leading Zero*	Disable*	14*
Never	Enable	Trailing Space	Enable	(0-255)
Only with PDF		X2 DPD		
		Modulo 7 CD		
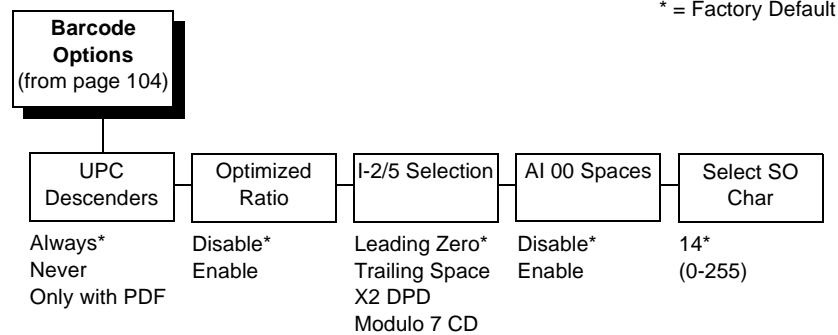
The following sub-options help define specific options regarding barcode printing.

UPC Descenders

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.

Optimized Ratio

This option selects different bar code ratios for certain bar codes including Code 39 and Interleaved 2 of 5. It is included for compatibility with the IGP-X00 printers.

• **Disable**. Use standard bar code ratios.

• **Enable**. Select the alternate bar code ratios.

Interleaved 2/5 Selection

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.

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- **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.

AI 00 Spaces

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.

Select SO Char.

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/PGL Programmer's Reference Manual* for details.

Host Form Length

Determines how the physical page size is affected upon an EXECUTE command.

- **Disable.** Forms printed in EXECUTE mode do not change the physical page size. Therefore, the size of the form (defined in CREATE mode) must fit within the current page dimensions, or errors may occur.

- **Enable.** The physical page length will change to match the form length (defined in CREATE mode). The physical page 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 LP+ logical dimensions.

PGL Normal

This parameter allows you to select whether the attributes associated with text printed in the PGL Normal mode are controlled by the PGL menu or the LinePrinter Plus menu.

- **LP+ Menu.** The default. PGL Normal mode text is printed with the attributes defined in the LinePrinter Plus menu.

- **PGL Menu.** PGL Normal mode text default is printed with the attributes defined in the PGL menu.

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Do FF at TOF

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.

IGP 100 Compatibility

This parameter forces the output to correspond with IGP-100 printer output in cases where there are differences. The default is disable.

Ignore Character

Ignore Mode

This parameter instructs the PGL to ignore the character selected under the Select Character menu.

- **Disable.** The PGL does not ignore any characters.

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

Select Character

Instructs the PGL which decimal character (0-255) to ignore from the host.

Error Report

Sets the error reporting capability on the printer for PGL forms.

- **On.** Null error boundry checking is reported (printed). Any element that cannot fit on the current page is reported (printed) as an error message.

- **Debug Mode.** Each line of the CREATE form will be printed along with an error message if one occurred. It has the same functionaility as when a slash was entered in the command before the CREATE form name.

- **Fault.** The printer will halt if an IGP/PGL error occurs. When "Fault" is selected, the IGP/PGL error will be printed and the message "IGP/PGL Error" will be displayed on the front panel, followed by the printer going offline.

- **Off.** No label boundry checking takes place. Graphics elements such as alpha, line, barcodes etc. will be printed and clipped if they exceed the page boundaries.

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IGP/PGL Character Set Menu

* = Factory Default

Select Font
(see page 104)

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		Latin 1 8859-1	
10) Italian	IBM CP 1046		Latin 5 8859-9	
11) Turkish	Arabic Lam 1		Latin 9 8859-15	
12-23) Reserved	Arabic Lam 2		Polish POL 1	
24-31) User Defined			Win. CP 1250	
32) Code Page 437			Win CP 1252	
33) Code Page 850			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
	PTT Turkish
	IBC Turkish
	Bull Turkish
	AS400 Turkish
	Unisys Turkish
	NCR Turkish
	PST Turkish
	UNIS-1 Turkish
	Code Page 853
	INFO Turkish

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IGP/VGL Emulation

Code V Graphics language (VGL) is an Intelligent Graphics Printing (IGP) software emulation designed for your thermal printer. The IGP Code V emulation of the QMS$^{®}$ Code V Version II programming language produces on-line forms, bar codes, and alphanumeric text-generation. The graphics processing features are detailed below.

IGP/VGL Features

On-Line Form and Label Generation makes it easy to create forms or labels with the "preprinted" look for each application. VGL 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. 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 VGL, 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.

Configuring The VGL With The Control Panel

You can select VGL default parameters directly from the control panel, or by control codes as explained in the *IGP/VGL Programmer's Reference Manual*. The VGL parameters are described on the following pages. Parameters marked with an asterisk (*) indicate the default value. The printer must be offline to enter the configuration structure.

Pressing an invalid key to enter a parameter value may move you to another level in the configuration or exit the configuration menu completely. Configure the IGP/VGL according to your specific requirements.

IMPORTANT   **BEFORE you reconfigure the IGP/VGL, print a configuration sheet to see all of the current settings.**

IGP/VGL Submenu

* = Factory Default

```
EMULATION
(IGP/VGL)
(from page 68)
```

| SFCC & Pwrup | Page Format | Graphics Options | Error Handling | Ignore/DB8 Setup |

SFCC & Pwrup
SFCC
  94* (17-255)
Power Up ^X
  Disable*/Enable
Power Up ^F
  Disable*/Enable
Power Up ^PY
  Disable*/Enable

Page Format
LPI
  6*-10
Btm Margin Ctl
  LP+ Menu
  VGL Text Length
Text Length
  66*
Autoeject
  Disable*
  Enable
Copy Count 1*-99
Host Form Length
  Disable*
  Enable

Graphics Options
(see page 116)

Error Handling
Error Msgs
  Enable*/Disable
Error Markers
  Enable*/Disable
Offpage Errors
  Disable*/Enable
Barcode Errors
  Enable*/Disable

Ignore/DB8 Setup
Ignore Chars
  Disable*
  Char 1
  Char 2
  Char 1 & 2
Ignore Ch#1
  0* (0-255)
Ignore Ch#2
  0* (0-255)
Data Bit 8
  Enable*/Disable

| Resolution | Font Options | PI Control |

Resolution
Cmd Resolution
  Low Resolution*
  High Resolution
^Dnn Dot Slew
  Low Resolution*
  High Resolution
Var Ratio Barcd
  Low Resolution*
  High Resolution

Font Options
(see page 123)

PI Control
Printer PI
  Disable*/Enable
Host PI
  Disable*/Enable
Max PI 16
  Enable*/Disable

SFCC & Pwrup

This option has several suboptions which define the SFCC and power-up configuration used with VGL.

SFCC

This option selects the Special Function Control Code. 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.

Power Up ^X

• **Disable**. The default.

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- **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.

Power Up ^F

- **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 VGL to ignore carriage returns, line feeds and all characters below hex 20 sent from the host.

Power Up ^PY

- **Disable**. The default.

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

Page Format

LPI

- Range of 6-10 lines per inch (lpi), with 6 being the default.

Btm Margin Ctl

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

Text Length

- 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.

Autoeject

- Determines paper handling upon exiting the IGP/VGL 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.

Copy Count

- Determines the number of identical copies of each physical page that will be printed.

Host Forms Length

- Sets the printer page size. DISABLE sets the printer page size equal to the Page Length set in the front panel under the PRINTER CONTROL menu. ENABLE sets the printer page length equal to the software host form length.

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Graphics Options

* = Factory Default

```
┌──────────────┐
│  Graphics    │
│  Options     │
│(from page 114)│
└──────────────┘
```

Slash 0	Ignore Dots	Append Rotated	Truncate Alpha	True Vert 1/10	Absorb After ^PY
Disable* Enable	Disable* Enable	Disable* Enable	Enable* Disable	Disable* Enable	Absorb Motion* Absorb All Disable

UPC Descenders	Rot. Char Size	Ignore Spaces	Midline PY	Width Limit	Absorb After ^PN
Enable* Disable	Adjusted* Not Adjusted	Disable* Enable	Disable* Enable	Disable* Enable	Disable* Enable

Following are several options which configure printing output.

Slash 0

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.

Ignore Dots

• **Disable.** The default.

• **Enable.** Causes the VGL 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.

Append Rotated

• **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.

Truncate Alpha

When enabled, this parameter prevents the printing of Error 48 (Element Off Page Error) if alphanumeric data, including spaces, extends beyond the right side of the form.

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True Vert 1/10

- **Disable.** When disabled (the default) 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.

Absorb after ^PY

- **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.

UPC Descenders

- **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.

Rot. Char Size

- **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.

Ignore Spaces

- **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.

Midline PY (includes ^PN)

- **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.

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Width Limit

When enabled, the system will limit the length and width for expanded characters to a limit shown in Table 5, which shows the maximum width allowed for a specific height in the range of 00 through 40 (0.0 through 4.0 inches).

Absorb After ^PN

- **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.

Table 5. Width Limit Table

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		

Error Handling

Following are several options which define how errors are reported.

Error Msgs

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

Error Markers

- **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.

Offpage Errors

- **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.

Barcode Errors

- **Enable.** An error message will print when invalid bar code data is encountered.
- **Disable.** VGL will not print an error for illegal bar code data; the bar code will be skipped.

NOTE: When Barcode Errors is disabled, the VGL 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.

Ignore / DB8 Setup

Following are several options which define character filtering and data bit 8.

Ignore Chars

- **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.

Ignore Ch#1

Specifies character 1 for the character filtering option. Valid decimal values are from 0 through 255.

Ignore Ch#2

Specifies character 2 for the character filtering option. Valid decimal values are from 0 through 255.

Data Bit 8

- **Enable.** The PI line is not passed directly from host to printer; all 8 bits are used for data bits, and characters in the hex 80-FF 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 hex 7F 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 hex 80-FF range. Therefore, to access characters in the hex 80-FF range, data bit 8 must be enabled.

Resolution

Cmd Resolution

- **Low Res.** The default. Sets a low command resolution mode.
- **High Res.** Sets a high command resolution mode.

^Dnn Dot Slew

- **Low Res.** The default. Sets the dot slew command dot values to be interpreted as 60 dpi P-Series dots.
- **High Res.** Sets the dot slew command dot values to be interpreted as print engine dots.

Var Ratio Barcd

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

Font Options

The Font Set specifies which language is currently selected for use with the VGL. Refer to page 123 for available selections.

Uniform Fonts

- **Disable.** The default. 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.

Proportional Line Length

- **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).

PI Control

Printer PI

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

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Host PI

- **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.

Max PI 16

- **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.

IGP/VGL Character Set Menu

* = Factory Default

Font Options
(from page 114)

Font Sets*	Uniform Fonts	Prop Line Length
	Disable* Enable	Enable* Disable

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	Arabic CP 864		Latin 1 8859-1	
10) Italian	Arabic CP 1046		Latin 5 8859-9	
11) Turkish	Arabic Lam 1		Latin 9 8859-15	
Code Page 437	Arabic Lam 2		Polish POL 1	
Code Page 850			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
	PTT Turkish
	IBC Turkish
	Bull Turkish
	AS400 Turkish
	Unisys Turkish
	NCR Turkish
	PST Turkish
	UNIS-1 Turkish
	Code Page 853
	INFO Turkish

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LinePrinter Plus Emulation

* = Factory Default

EMULATION
(from page 68)

LinePrinter+

Printer Protocol	Orientation	CPI/LPI Select	Font Attributes
(see next page)	Portrait* Landscape Inv. Portrait Inv. Landscape	Select CPI 10.0 CPI* 12.0 CPI 13.3 CPI 15.0 CPI 17.1 CPI 20.0 CPI Select LPI 6.0 LPI* 8.0 LPI 10.3 LPI	*(see next page)*

Plot Attributes	Page Format	Print Char. Set	Reset Cmd CFG Ld
Horizontal DPI 120* DPI (60-400) Vertical DPI (72*-400)	*(see page 130)*		Disable* Power up config Current config Factory config

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LinePrinter Plus Submenus

* = Factory Default

Printer Protocol
(from page 124)

P-Series	P-Series XQ	Serial Matrix	Proprinter XL	Epson FX
(see page 132)	*(see page 136)*	*(see page 139)*	*(see page 142)*	*(see page 145)*
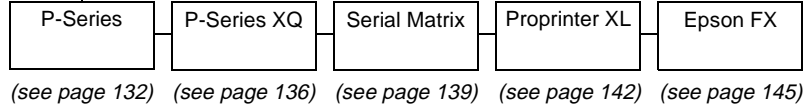
Font Attributes
(from page 124)

Typeface	Prop. Spacing	Bold Print	Italic Print	Slashed Zero	Text Position
Letter Gothic* Courier OCR-A OCR-B	Disable* Enable	Disable* Enable	Disable* Forward Slant Backward Slant	Disable* Enable	Top of Line* Bottom of Line

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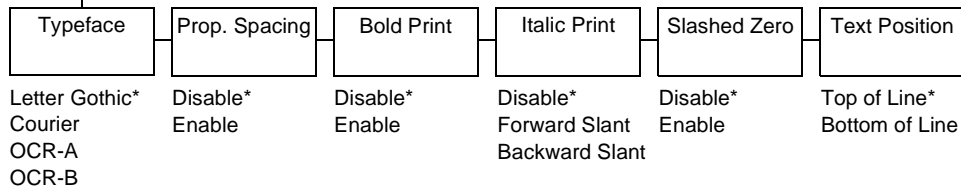
Printer Protocol

Select the LinePrinter+ protocol you wish to use. Refer to the *LinePrinter Plus Programmer's Reference Manual* for more information.

Orientation

- **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.

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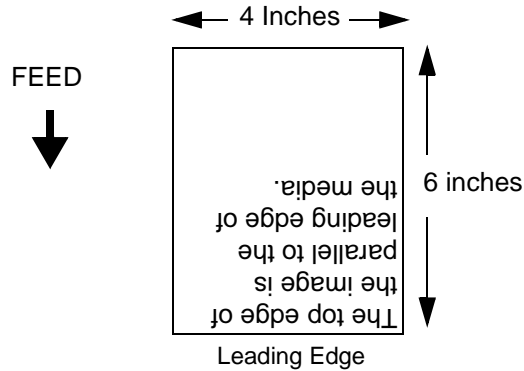
- **Inv. Portrait**. Inverse Portrait refers to vertical page orientation, where the height of a page is greater than its width. The top edge of the image is parallel to the trailing edge of the media. The following illustration is an example, with the operator viewing the front of the printer.

Leading Edge

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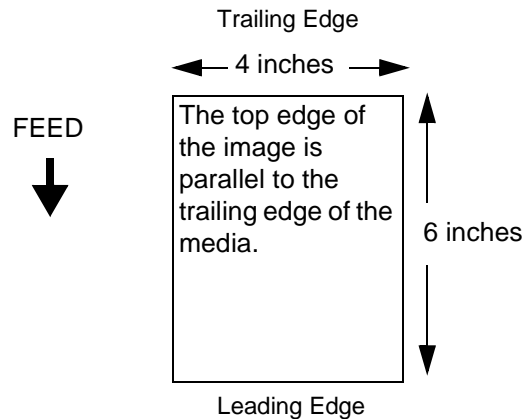
- **Landscape**. Landscape refers to horizontal orientation, where the width of a page is greater than its height. The top edge of the image is the left edge of the media. The following illustration is an example, with the operator viewing the front of the printer.

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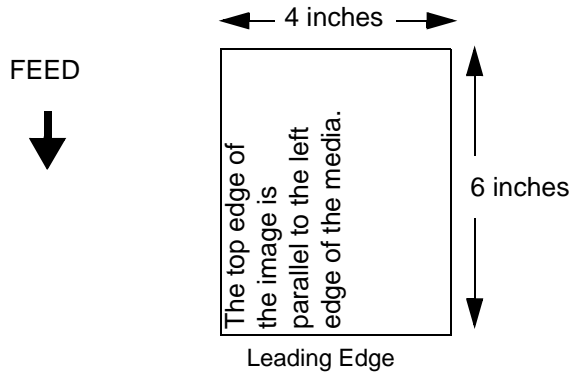
- **Inv. Landscape**. Inverse Landscape refers to horizontal orientation, where the width of a page is greater than its height. The top edge of the image is the right edge of the media (the left edge of the image is the trailing edge of the media). The following illustration is an example, with the operator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

Leading Edge
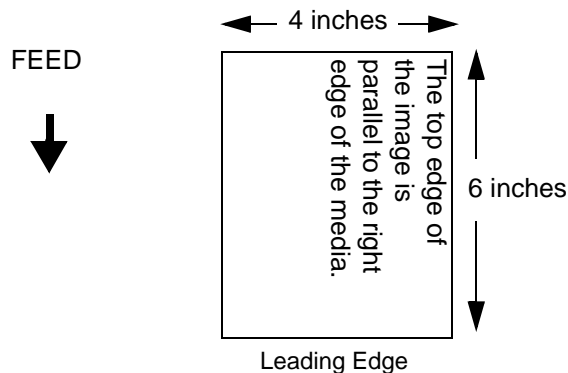
CPI/LPI Select

This parameter lets you specify the characters per inch (cpi) and lines per inch (lpi) values.

Font Attributes

Typefaces

- **Letter Gothic**. The default. Letter Gothic is a non-proportional (monospaced) sans serif 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.

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Proportional Spacing

Each printed character is contained inside a character cell. The width of the character cell includes the character and the space around the character.

- **Disable**. Each character cell is printed with the same width. Each column in the printed text will line up.

  ```
  This example is printed with
  proportional spacing disabled.
  ```

- **Enable**. The width of each character cell varies with the width of the character. For example, [i] takes less space to print than [m]. Using proportional fonts generally increases the readability of printed documents, giving text a typeset appearance.

  This example is printed with proportional spacing enabled

Bold Print

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

Italic Print

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

Slash Zero

This parameter allows you to print the numeral "0" with or without the slash. This option applies to all character sets except OCR-A and OCR-B.

- **Disable**. Zero is printed without a slash.
- **Enable**. Zero is printed with a slash.

128

Text Position

Specifies where the text will be positioned in the line space. When set to Top of Line, text will be positioned at the top of the line space. When set to Bottom of Line, the text will be positioned as if it were at the bottom of a 6 lpi line space. The following example shows both Top of Line and Bottom of Line text positions:

Text Position
Top of Line

Text Position
Bottom of Line
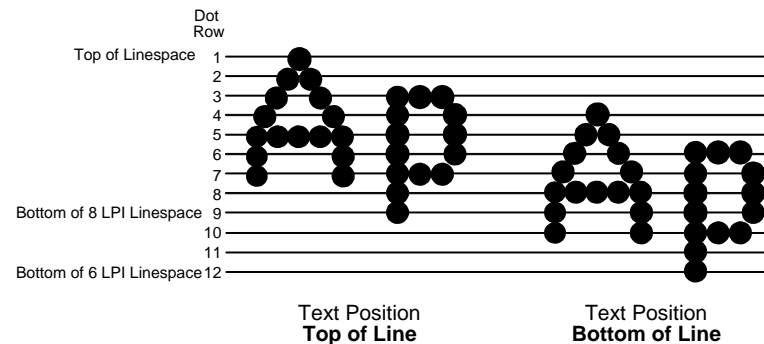
Plot Attributes

This feature enables the T4204 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 and 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 T4204 is only capable of printing up to 203 dpi horizontal and vertical resolution.

129

Page Format

* = Factory Default
[1]These menus do not appear if the Coax or Twinax host interface is selected. See page 77.

Page Format (from page 124)

Form Length	Form Width	Host Forms Length	Margins	Perforation Skip

Absolute Length[1]
6* inches
(00.0-24.0)
Funct. of LPI
36* lines
(0-144)

Absolute Width [1]
4.1* inches
(0.0-13.6)
Funct. of CPI
41* Characters
(1-272)

Disable*
Enable

Logical Form
Left Margin[1]
  0* characters
  (0-369)
Right Margin[1]
  0* characters
  (0-369)
Top Margin
  0 linespaces*
  (0-451)
Bottom Margin
  0* linespaces
  (0-451)
Physical Page
Left Margin[1]
  0* inches
  (0-13.20)
Right Margin[1]
  0* inches
  (0-13.20)
Top Margin
  0 inches*
  (0-24.00)
Bottom Margin
  0* inches
  (0-24.00)

Disable*
1/2 inch
2/3 inch
5/6 inch
1 inch

Margins - Logical Form

- **Left Margin**. Set in characters. Character zero is defined as the far left edge of the page, and column numbering increments from left to right.

- **Right Margin**. Set in characters. Character zero is defined as the far right edge of the page, and column numbering increments from right to left.

- **Top Margin**. Defined in linespaces, starting from line zero at the top of the page and incrementing from the top down.

- **Bottom Margin**. Defined in linespaces, starting from line zero at the bottom of the page and incrementing from the bottom up.

130

Margins - Physical Page

- **Left Margin**. Set in inches. Inch zero is defined as the far left edge of the page, and column numbering increments from left to right.

- **Right Margin**. Set in inches. Inch zero is defined as the far right edge of the page, and column numbering increments from right to left.

- **Top Margin**. Defined in inches, starting from inch zero at the top of the page and incrementing from the top down.

- **Bottom Margin**. Defined in inches, starting from inch zero at the bottom of the page and incrementing from the bottom up.

Perforation Skip

- **Disable**. Allows printing on page perforation.

- You may set up a skip-over margin of 1/2 inch, 2/3 inch, 5/6 inch, or 1 inch. For example, a skip-over margin of 1 inch allows a 1 inch margin at the bottom of the page.

Forms Length

Forms length is the number of lines that can be printed on a page. You can set forms length in inches, or as a function of the current LPI (lines per inch).

Form Width

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.

Host Forms Length

- **Disable**. The default. Sets the form length equal to the PRINTER CONTROL menu Page Length value.

- **Enable**. Sets the form length equal to the form length specified in a host software command.

NOTE: When the optional CTHI (Coax/Twinax Host Interface) is selected Host Forms Length must be set to Disable.

LinePrinter Plus P-Series Emulation

* = Factory Default
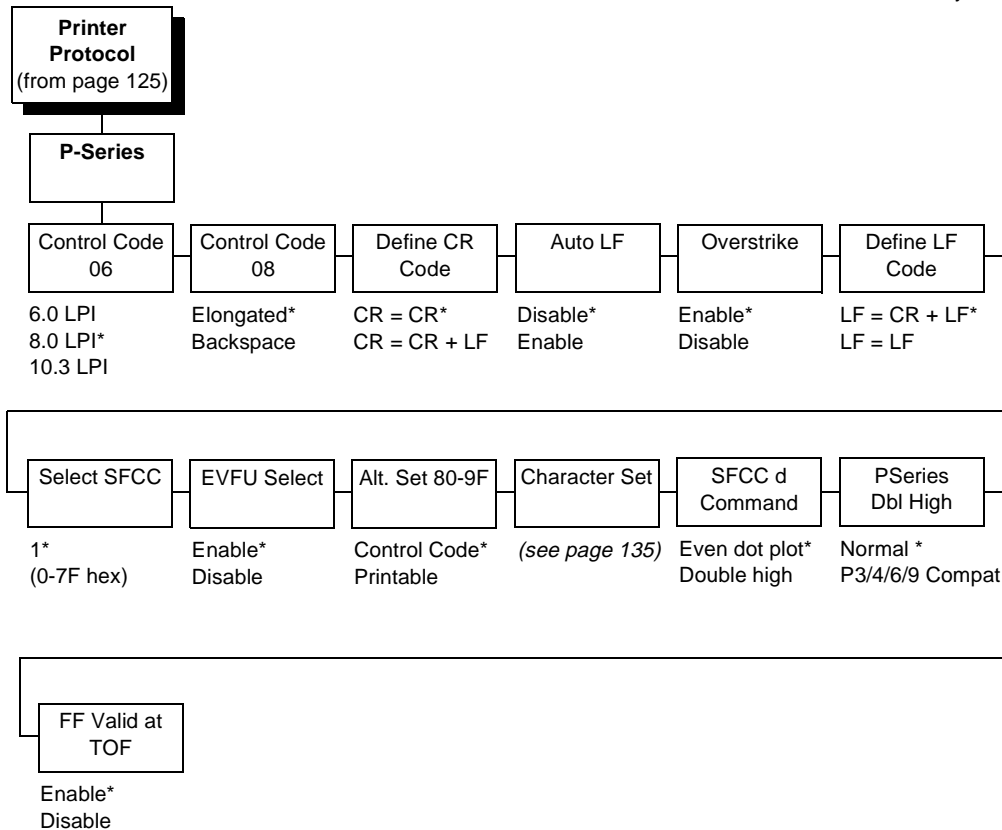
```
┌─────────────┐
│   Printer   │
│  Protocol   │
│(from page 125)│
└─────────────┘
       │
┌─────────────┐
│  P-Series   │
└─────────────┘
       │
```

Control Code 06	Control Code 08	Define CR Code	Auto LF	Overstrike	Define LF Code
6.0 LPI 8.0 LPI* 10.3 LPI	Elongated* Backspace	CR = CR* CR = CR + LF	Disable* Enable	Enable* Disable	LF = CR + LF* LF = LF

Select SFCC	EVFU Select	Alt. Set 80-9F	Character Set	SFCC d Command	PSeries Dbl High
1* (0-7F hex)	Enable* Disable	Control Code* Printable	*(see page 135)*	Even dot plot* Double high	Normal * P3/4/6/9 Compat

FF Valid at TOF
Enable* Disable

Control Code 06

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

Control Code 08

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

Define CR Code

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

- **CR = CR**. 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.

132

Auto LF

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.

Overstrike

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.

Define LF Code

*   **LF = CR + LF**. Forces an automatic carriage return with each line feed command. The next print position is position 1 of the next line.

*   **LF = LF**. Does not perform an automatic carriage return. The next print position will be the current print position of the next line.

Select SFCC

This parameter allows you to select which ASCII codes will function as the Special Function Control Code (SFCC) command delimiter. P-Series codes can use hex 00 through hex 7F. Options include the following:

*   ESC (hex 1B)

*   SOH (hex 01)

*   ETX (hex 03)

*   CIRCUMFLEX (hex 5E)—also called caret (^)

*   TILDE (hex 7E)—(~)

NOTE: SOH, ETX and ESC are non-printables. The characters (^) and (~) are printable; however, do not use them as printables in the host data stream if either is chosen as a delimiter, or print errors will occur.

EVFU Select

Controls how the printer handles vertical formatting.

*   **Enable**. The default. Selects P-Series compatible Electronic Vertical Format Unit (EVFU).

*   **Disable**. Disables all EVFU processing.

133

Alt. Set 80-9F

Determines whether the printer processes ASCII codes hex 80 through hex 9F as control codes or as printable characters.

Character Set

Specifies a character set as shown in the page 135. To use one of these sets, choose the desired group heading (such as European Sets) and press ENTER. Then choose the desired set within that group (such as Roman 8) and press ENTER. Both the group and the desired set will be starred to indicate your selection. Character sets are shown in detail in the *Character Sets Reference Manual*.

SFCC d Command

- **Even dot plot**. This option interprets Speed Command as even dot plot.
- **Double high**. This option interprets Speed Command as double high. Select this option for backward compatibility.

PSeries Dbl High

- **Normal**. This normal Double High printing for current and older 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).

FF Valid at TOF

- **Enable**. Performs a form feed when the host sends a Form Feed command and the printer is at the top of form.
- **Disable**. Will not perform a form feed when the host sends a Form Feed command and the printer is at the top of form.

134

P-Series Character Set Menu

* = Factory Default

Character Set
(from page 132)

Standard Sets*	Arabic Sets	Cyrillic Sets	European Sets	Greek Sets	Hebrew Sets

Arabic Sets
ASMO 449*
ASMO 449+
ASMO 708
ASMO 708+
MSDOS CP710
MSDOS CP720
Sakr CP 714
Aptec CP715
CP 786
Arabic CP 864
Arabic CP 1046
Arabic Lam 1
Arabic Lam 2

Cyrillic Sets
Cyrillic 866*
Cyrillic CP 437
Cyrillic 113
Cyrillic 8859-5
ISO 915
Code Page 855
Cyrillic 7-bit
Ukrainian
Bulgarian

European Sets
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 8859-15
Polish POL 1
Win. CP 1250
Win CP 1252
Win CP 1257

Greek Sets
DEC 256 Greek*
ELOT 928 Greek
Greek 3
ABY Greek
ABG Greek
ELOT 927 Greek
Greek 851
Greek 437
Greek 8859-7

Hebrew Sets
Hebrew Old*
Hebrew New
Hebrew DEC
Latin-1 Hebrew

Turkish Sets
Data Gen. Turk.*
DEC Turkish
IBM Turkish
Siemens Turkish
PTT Turkish
IBC Turkish
Bull Turkish
AS400 Turkish
Unisys Turkish
NCR Turkish
PST Turkish
UNIS-1 Turkish
Code Page 853
INFO Turkish

IBM PC*	Multinational	ECMA Latin 1	DEC Multinational

IBM PC*
Primary Subset
  ASCII (USA)*
  French
  German
  English
  Danish
  Swedish
  Italian
  Spanish
  Japanese
  French Canadian
  Latin American
  Norwegian
  Danish II
  Spanish II
  Latin Am II
Extended Subset
  Code Page 437*
  Code Page 850

Multinational
ASCII (USA)*
EBCDIC

ECMA Latin 1
Primary Subset
  ASCII (USA)*
  German
  Swedish
  Danish
  Norwegian
  Finnish
  English
  Dutch
  French
  Spanish
  Italian
  Turkish
  Japanese
Extended Subset
  Multinational*
  Barcode 10 CPI
  Mult. DP 10 CPI
  Mult. DP 12 CPI
  Mult. LQ 10 CPI
  Greek DP 10 CPI
  Greek DP 12 CPI
  Greek LQ 10 CPI
  Grap. DP 10 CPI
  Grap. LQ 10 CPI
  Sci. DP 10 CPI
  Sci. DP 12 CPI
  Sci. LQ 10 CPI

DEC Multinational
ASCII (USA)*
French
German
English
Norweg./Danish
Swedish
Italian
Spanish
Japanese
French Canadian
Dutch
Finnish
Swiss

OCR-A	OCR-B

135

LinePrinter Plus P-Series XQ Emulation

* = Factory Default

```
┌──────────────────┐
│     Printer      │
│    Protocol      │
│  (from page 125) │
└──────────────────┘
         │
┌──────────────────┐
│   P-Series XQ    │
└──────────────────┘
```

Control Code 06	Define CR Code	Auto LF	Define LF Code	Compressed Print	Elong/Alt. Font
6.0 LPI	CR = CR*	Disable*	LF = CR + LF*	char 01 SOH*	Elng=BS Font=SO*
8.0 LPI*	CR = CR + LF	Enable	LF = LF	char 03 ETX	Elng=SO Font=BS
10.3 LPI				char 09 HT	

Gothic Typeface	EVFU Select	Upr. Case Select	Slew Relative
char 02 STX*	Enable*	Disable*	1-16 Lines*
char 03 ETX	Disable	Enable	1-15 Lines
char 09 HT			

Control Code 06

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

Define CR Code

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

•   **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.

•   **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return. The next print position will be print position 1 of the next line.

Auto LF

This option defines the printer action when print data is received past the forms width setting.

•   **Disable**. Discards any data past the forms width.

•   **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.

136

Define LF Code

- **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.

Compressed Print

Controls which host command sets compressed printing.

- CHAR 01 SOH

- CHAR 03 ETX

- CHAR 09 HT

Elong/Alt. Font

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

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

- ELNG=SO FONT=BS

Gothic Typeface

Controls which host command sets high speed printing.

- CHAR 02 STX

- CHAR 03 ETX

- CHAR 09 HT

EVFU Select

Controls how the printer handles vertical formatting. Choices are:

- **Enable**. The default. Selects P-Series compatible Electronic Vertical Format Unit (EVFU).

- **Disable**. Disables all VFU processing.

Upper Case Select

Controls how the printer handles lowercase characters it receives from the host computer. When enabled, all characters will be printed in uppercase.
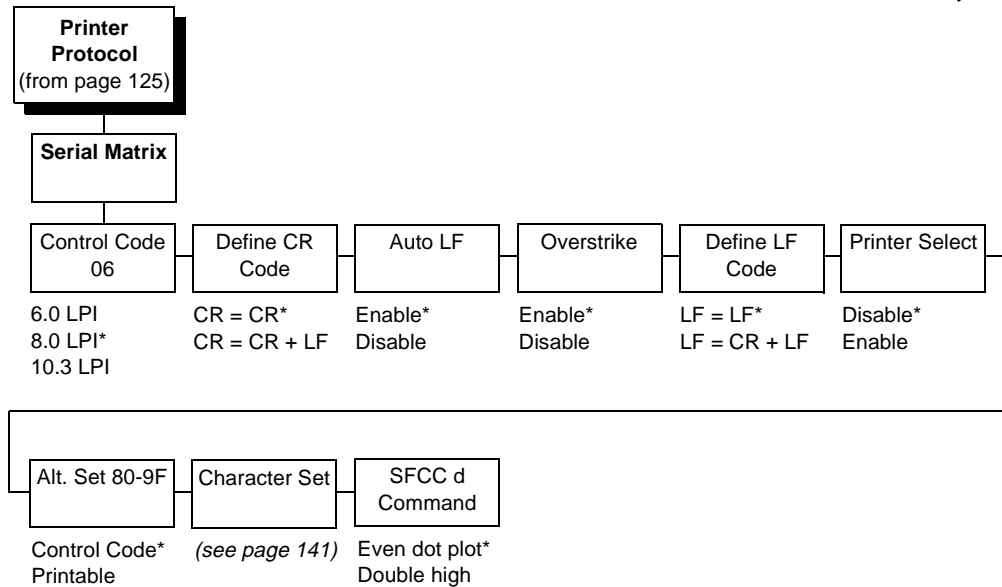
- **Disable**. Prints lowercase characters received from the host computer as lowercase, and uppercase characters received from the computer as uppercase.

- **Enable**. Prints lowercase characters received from the host computer as their corresponding uppercase equivalents; uppercase characters received from the computer are printed as uppercase.

137

Slew Relative

"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.

LinePrinter Plus Serial Matrix Emulation

* = Factory Default

```
┌──────────────┐
│   Printer    │
│  Protocol    │
│(from page 125)│
└──────┬───────┘
       │
┌──────┴───────┐
│Serial Matrix │
└──────┬───────┘
       │
```

Control Code 06	Define CR Code	Auto LF	Overstrike	Define LF Code	Printer Select
6.0 LPI	CR = CR*	Enable*	Enable*	LF = LF*	Disable*
8.0 LPI*	CR = CR + LF	Disable	Disable	LF = CR + LF	Enable
10.3 LPI					

Alt. Set 80-9F	Character Set	SFCC d Command
Control Code*	*(see page 141)*	Even dot plot*
Printable		Double high

Control Code 06

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

Define CR Code

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

• **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.

• **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return. The next print position will be print position 1 of the next line.

Auto LF

The Auto LF option defines the printer actions when print data is received past the forms width setting.

• **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.

• **Disable**. Discards any data past the forms width.

139

Overstrike

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.

Define LF Code

- **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.
- **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.

Printer Select

- **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.

Alternate Set 80-9F

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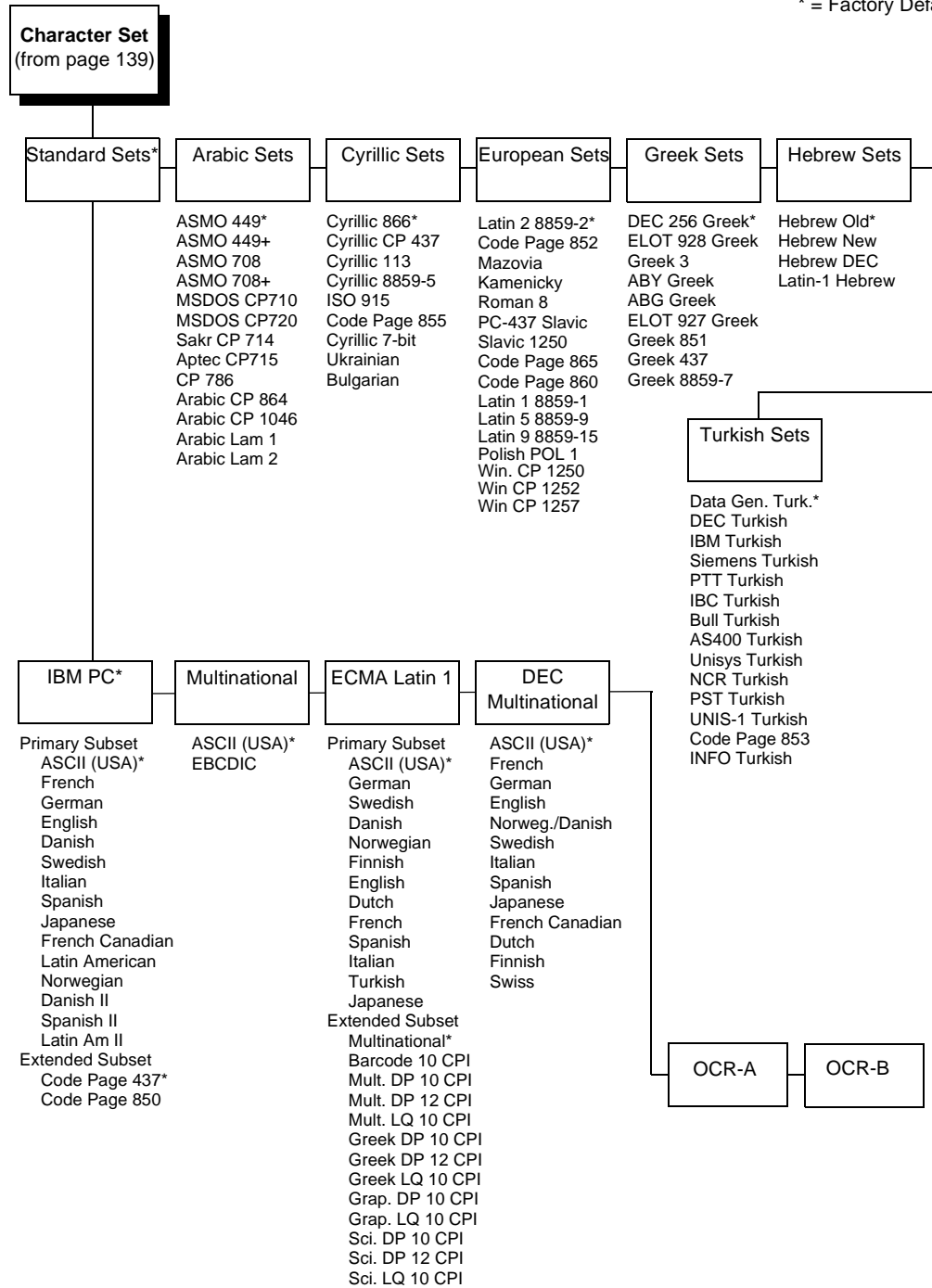- **Printable**. Prints data in the range of hex 80 through hex 9F.

Character Set

Specifies a character set as shown in the page 141. To use one of these sets, choose the desired group heading (such as European Sets) and press ENTER. Then choose the desired set within that group (such as Roman 8) and press ENTER. Both the group and the desired set will be starred to indicate your selection. Character sets are shown in detail in the *Character Sets Reference Manual*.

SFCC d Command

- **Even dot plot**. This option interprets Speed Command as even dot plot.
- **Double high**. This option interprets Speed Command as double high. Select this option for backward compatibility.
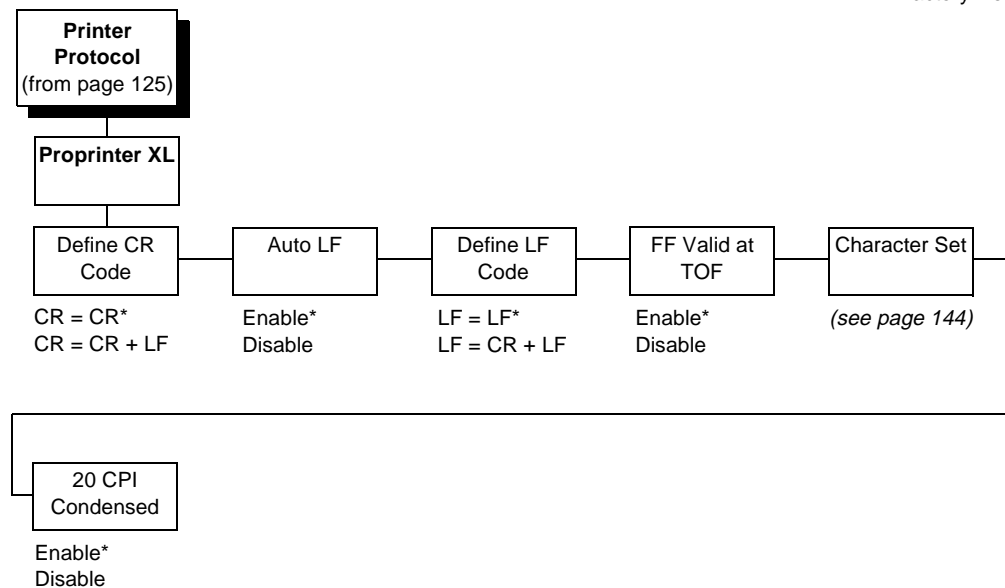
Serial Matrix Character Set Menu

* = Factory Default

Character Set
(from page 139)

Standard Sets*	Arabic Sets	Cyrillic Sets	European Sets	Greek Sets	Hebrew Sets
	ASMO 449*	Cyrillic 866*	Latin 2 8859-2*	DEC 256 Greek*	Hebrew Old*
	ASMO 449+	Cyrillic CP 437	Code Page 852	ELOT 928 Greek	Hebrew New
	ASMO 708	Cyrillic 113	Mazovia	Greek 3	Hebrew DEC
	ASMO 708+	Cyrillic 8859-5	Kamenicky	ABY Greek	Latin-1 Hebrew
	MSDOS CP710	ISO 915	Roman 8	ABG Greek	
	MSDOS CP720	Code Page 855	PC-437 Slavic	ELOT 927 Greek	
	Sakr CP 714	Cyrillic 7-bit	Slavic 1250	Greek 851	
	Aptec CP715	Ukrainian	Code Page 865	Greek 437	
	CP 786	Bulgarian	Code Page 860	Greek 8859-7	
	Arabic CP 864		Latin 1 8859-1		
	Arabic CP 1046		Latin 5 8859-9		
	Arabic Lam 1		Latin 9 8859-15		
	Arabic Lam 2		Polish POL 1		
			Win. CP 1250		
			Win CP 1252		
			Win CP 1257		

Turkish Sets

Data Gen. Turk.*
DEC Turkish
IBM Turkish
Siemens Turkish
PTT Turkish
IBC Turkish
Bull Turkish
AS400 Turkish
Unisys Turkish
NCR Turkish
PST Turkish
UNIS-1 Turkish
Code Page 853
INFO Turkish

IBM PC*	Multinational	ECMA Latin 1	DEC Multinational
Primary Subset	ASCII (USA)*	Primary Subset	ASCII (USA)*
ASCII (USA)*	EBCDIC	ASCII (USA)*	French
French		German	German
German		Swedish	English
English		Danish	Norweg./Danish
Danish		Norwegian	Swedish
Swedish		Finnish	Italian
Italian		English	Spanish
Spanish		Dutch	Japanese
Japanese		French	French Canadian
French Canadian		Spanish	Dutch
Latin American		Italian	Finnish
Norwegian		Turkish	Swiss
Danish II		Japanese	
Spanish II		Extended Subset	
Latin Am II		Multinational*	
Extended Subset		Barcode 10 CPI	
Code Page 437*		Mult. DP 10 CPI	
Code Page 850		Mult. DP 12 CPI	
		Mult. LQ 10 CPI	
		Greek DP 10 CPI	
		Greek DP 12 CPI	
		Greek LQ 10 CPI	
		Grap. DP 10 CPI	
		Grap. LQ 10 CPI	
		Sci. DP 10 CPI	
		Sci. DP 12 CPI	
		Sci. LQ 10 CPI	

OCR-A	OCR-B

141

LinePrinter Plus Proprinter XL Emulation

```
┌─────────────┐
│  Printer    │
│  Protocol   │
│(from page 125)│
└─────────────┘
       │
┌─────────────┐
│Proprinter XL│
└─────────────┘
       │
┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐  ┌──────────┐
│Define CR │  │ Auto LF  │  │Define LF │  │FF Valid at│  │Character Set│
│  Code    │  │          │  │  Code    │  │   TOF    │  │          │
└──────────┘  └──────────┘  └──────────┘  └──────────┘  └──────────┘

CR = CR*       Enable*       LF = LF*       Enable*       (see page 144)
CR = CR + LF   Disable       LF = CR + LF   Disable

┌──────────┐
│ 20 CPI   │
│Condensed │
└──────────┘
Enable*
Disable
```

Define CR Code

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

- **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.

- **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return.

Auto LF

This option defines the printer actions when print data is received past the forms width setting.

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

- **Disable**. Discards any data past the forms width.

Define LF Code

- **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.

- **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.

142

FF Valid At TOF

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

- **Disable**. Will not perform a form feed when the host sends a Form Feed command and the printer is at the top of form.

Character Set

Specifies a character set as shown in the page 144. To use one of these sets, choose the desired group heading (such as European Sets) and press ENTER. Then choose the desired set within that group (such as Roman 8) and press ENTER. Both the group and the desired set will be starred to indicate your selection. Character sets are shown in detail in the *Character Sets Reference Manual*.

20 CPI Condensed

Compressed print characters are narrower than the normal character set. This is helpful for applications where you need to print the maximum amount of information on a page.
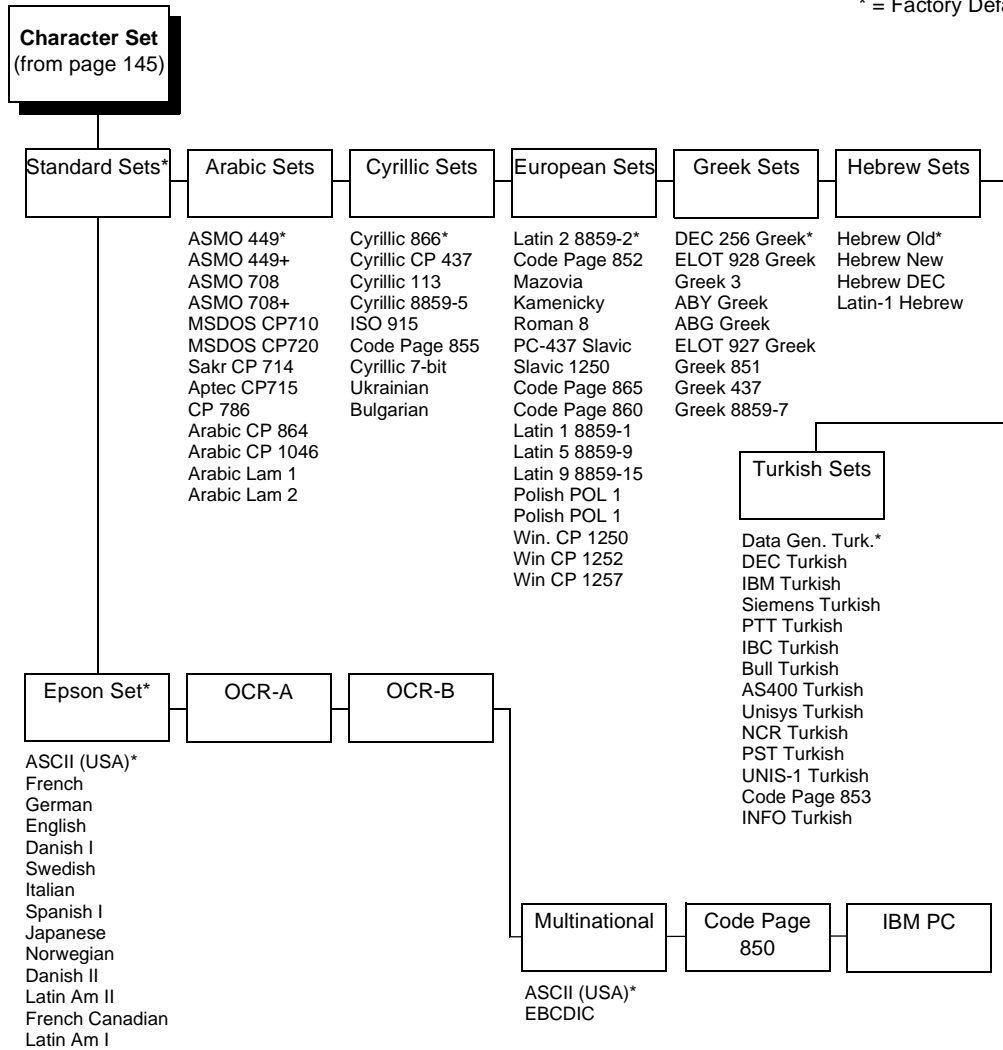
- **Enable**. Prints characters about 60 percent the width of normal characters when compressed print is chosen by the host computer.

- **Disable**. Does not compress print widths, even if condensed print is chosen by the host.
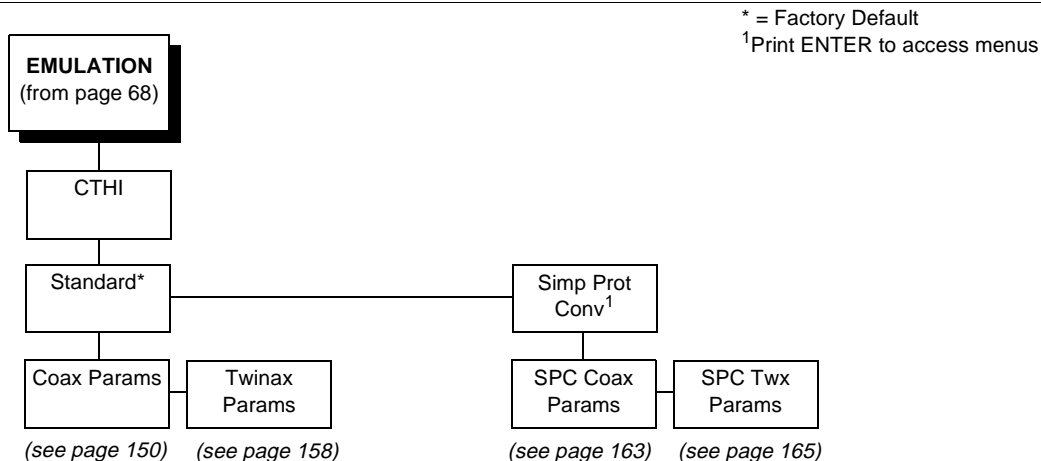
Alt. Set 80-9F

Determines whether the printer processes ASCII codes hex 80 through hex 9F as control codes or as printable characters.

143

Proprinter XL Character Set Menu

* = Factory Default

Character Set
(from page 142)

Standard Sets*	Arabic Sets	Cyrillic Sets	European Sets	Greek Sets	Hebrew Sets
	ASMO 449*	Cyrillic 866*	Latin 2 8859-2*	DEC 256 Greek*	Hebrew Old*
	ASMO 449+	Cyrillic CP 437	Code Page 852	ELOT 928 Greek	Hebrew New
	ASMO 708	Cyrillic 113	Mazovia	Greek 3	Hebrew DEC
	ASMO 708+	Cyrillic 8859-5	Kamenicky	ABY Greek	Latin-1 Hebrew
	MSDOS CP710	ISO 915	Roman 8	ABG Greek	
	MSDOS CP720	Code Page 855	PC-437 Slavic	ELOT 927 Greek	
	Sakr CP 714	Cyrillic 7-bit	Slavic 1250	Greek 851	
	Aptec CP715	Ukrainian	Code Page 865	Greek 437	
	CP 786	Bulgarian	Code Page 860	Greek 8859-7	
	Arabic CP 864		Latin 1 8859-1		
	Arabic CP 1046		Latin 5 8859-9		
	Arabic Lam 1		Latin 9 8859-15		
	Arabic Lam 2		Polish POL1		
			Polish POL 1		
			Win. CP 1250		
			Win CP 1252		
			Win CP 1257		

Turkish Sets

Data Gen. Turk.*
DEC Turkish
IBM Turkish
Siemens Turkish
PTT Turkish
IBC Turkish
Bull Turkish
AS400 Turkish
Unisys Turkish
NCR Turkish
PST Turkish
UNIS-1 Turkish
Code Page 853
INFO Turkish

Code Page 437*	Code Page 850	OCR-A	OCR-B	Multinational
				ASCII (USA)*
				EBCDIC

144

LinePrinter Plus Epson FX Emulation

* = Factory Default

```
┌─────────────┐
│   Printer   │
│  Protocol   │
│(from page 125)│
└──────┬──────┘
       │
┌──────┴──────┐
│  Epson FX   │
└──────┬──────┘
```

Define CR Code	Auto LF	Define LF Code	Printer Select	Character Set	20 CPI Condensed
CR = CR*	Enable*	LF = LF*	Disable*	*(see page 147)*	Enable*
CR = CR + LF	Disable	LF = CR + LF	Enable		Disable

Alt. Set 80-9F
Control Code*
Printable
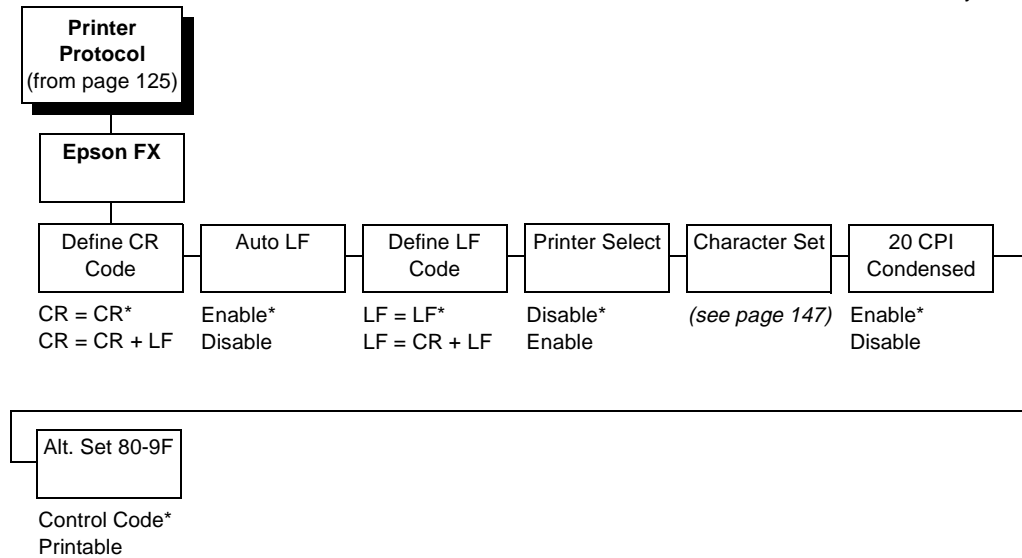
Define CR Code

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

•   **CR = CR**. Does not insert an extra Line Feed after each Carriage Return.

•   **CR = CR + LF**. Inserts an extra Line Feed after each Carriage Return.

Auto LF

This option defines the printer actions when print data is received past the forms width setting.

•   **Enable**. Performs an automatic carriage return and line feed when data is received past the forms width.

•   **Disable**. Discards any data past the forms width.

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Define LF Code

The Define LF Code option controls the action of the printer when it receives a Line Feed code (hex 0A) from the host computer. If this feature is enabled, each time the printer receives a Line Feed, it inserts an additional Carriage Return code (hex 0D) into the data stream. This feature is required if the host computer does not send Carriage Returns to the printer.

- **LF = LF**. Does not add a Carriage Return with a Line Feed.

- **LF = CR + LF**. Adds an extra Carriage Return with each Line Feed.

Printer Select

- **Disable**. 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.

Character Set

This parameter selects a character set for the Epson emulation, as shown in the page 147. Note that when OCR-A or OCR-B is selected as the print language, the Font Attribute Typeface option under the LinePrinter Plus menu (page 127) is changed to OCR-A or OCR-B, respectively.

To use one of these sets, choose the desired group heading (such as European Sets) and press ENTER. Then choose the desired set within that group (such as Roman 8) and press ENTER. Both the group and the desired set will be starred to indicate your selection. Character sets are shown in detail in the *Character Sets Reference Manual*.

20 CPI Condensed

Compressed print characters are narrower than the normal character set. This is helpful for applications where you need to print the maximum amount of information on a page.

- **Enable**. 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.

Alt. Set 80-9F

Determines whether the printer processes ASCII codes hex 80 through hex 9F as control codes or as printable characters.

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LinePrinter Plus Epson FX Character Set Menu

* = Factory Default

Character Set
(from page 145)

Standard Sets*	Arabic Sets	Cyrillic Sets	European Sets	Greek Sets	Hebrew Sets

	Arabic Sets	Cyrillic Sets	European Sets	Greek Sets	Hebrew Sets
	ASMO 449*	Cyrillic 866*	Latin 2 8859-2*	DEC 256 Greek*	Hebrew Old*
	ASMO 449+	Cyrillic CP 437	Code Page 852	ELOT 928 Greek	Hebrew New
	ASMO 708	Cyrillic 113	Mazovia	Greek 3	Hebrew DEC
	ASMO 708+	Cyrillic 8859-5	Kamenicky	ABY Greek	Latin-1 Hebrew
	MSDOS CP710	ISO 915	Roman 8	ABG Greek	
	MSDOS CP720	Code Page 855	PC-437 Slavic	ELOT 927 Greek	
	Sakr CP 714	Cyrillic 7-bit	Slavic 1250	Greek 851	
	Aptec CP715	Ukrainian	Code Page 865	Greek 437	
	CP 786	Bulgarian	Code Page 860	Greek 8859-7	
	Arabic CP 864		Latin 1 8859-1		
	Arabic CP 1046		Latin 5 8859-9		
	Arabic Lam 1		Latin 9 8859-15		
	Arabic Lam 2		Polish POL 1		
			Polish POL 1		
			Win. CP 1250		
			Win CP 1252		
			Win CP 1257		

Turkish Sets

Data Gen. Turk.*
DEC Turkish
IBM Turkish
Siemens Turkish
PTT Turkish
IBC Turkish
Bull Turkish
AS400 Turkish
Unisys Turkish
NCR Turkish
PST Turkish
UNIS-1 Turkish
Code Page 853
INFO Turkish

Epson Set*	OCR-A	OCR-B

ASCII (USA)*
French
German
English
Danish I
Swedish
Italian
Spanish I
Japanese
Norwegian
Danish II
Latin Am II
French Canadian
Latin Am I

Multinational	Code Page 850	IBM PC

ASCII (USA)*
EBCDIC

147

Coax/Twinax Emulation

```
┌─────────────┐
│ EMULATION   │
│ (from page 68)│
└─────────────┘
       │
┌─────────────┐
│    CTHI     │
└─────────────┘
       │
┌─────────────┐                    ┌─────────────┐
│  Standard*  │────────────────────│  Simp Prot  │
└─────────────┘                    │   Conv[1]   │
       │                           └─────────────┘
┌──────────┐ ┌──────────┐          ┌──────────┐ ┌──────────┐
│  Coax    │ │  Twinax  │          │ SPC Coax │ │ SPC Twx  │
│  Params  │ │  Params  │          │  Params  │ │  Params  │
└──────────┘ └──────────┘          └──────────┘ └──────────┘
(see page 150) (see page 158)      (see page 163) (see page 165)
```

Standard C/T Interface

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

• 3287 Models 1 and 2

• 4234 Model 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

NOTE: The standard Coax/Twinax emulation selection will only be available if Coax or Twinax is selected from the HOST INTERFACE menu. See page 77.

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

Simple Protocol Converter

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 Printronix thermal printer with the Coax/Twinax (CTHI) capability as done using a non-CT printer with the third party converter interfaces.

The SPC replaces the third party add-on protocol converters attached to older Printronix thermal printers.

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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$^{®}$
- 3270 Mainframes

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, IGP/VGL, and IGP/PGL 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 page 78). 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.

149

Coax Emulation Menu

* = Factory Default

```
          ┌─────────────┐
          │    CTHI     │
          │(from page 148)│
          └──────┬──────┘
          ┌──────┴──────┐
          │  Standard*  │
          └──────┬──────┘
          ┌──────┴──────┐
          │ Coax Params │
          └──────┬──────┘
```

Char Set Select	Translation Tbl	Active Char Set	PA1	PA2
(see next page)		Secondary Set* Primary Set		

Buffer Reprint	Device ID	Early Print Cmpl	SCS Buffer Cntrl	Cancel IGP/DCU	PTX Transparent
	4234* 3287	Disable* Enable	Do not wait* Wait until done	Enable* Disable	Lead-in Chars Set 1 <%>* Set 2 ¬¬$ Set 3 _%_ Alt. Set 80-9F Printable* Control Code

Change Case	Set Text Orient	Image Buf Size	Intervention Req	Compatibility Op	Translate Table
Dual Case* Mono Case	Control By Host* Left to Right Right to Left	4K 2K	Send to Host* Do Not Send	*(see page 151)*	Default* Downloaded

Host Override	Format Control	Max. Print Width	Buffer Print
Disable* Enable	Disable* Enable	13.2 inches* Printer Width	Disable* Enable

Char Set Select

*= Factory Default

| Char Set Select
(from page 150) | | | |

Primary Sets		Secondary Sets	
0037 English US*	0500 Belg. New	English US*	Portuguese
0037 Eng Nether	0803 Hebrew Old	English UK	Portug. Alt
0285 English UK	0424 Hebrew	Austrian/German	Spanish
0273 Austr/Germ	0892 OCR A	German Alt	Spanish Alt
0274 Belg. Old	0893 OCR B	Belgian	Spanish Speak.
0275 Brazilian	0420 Arabic	Brazilian	Swiss French/German
0260 Canad Fren	0880 Cyril. Old	Canadian French	Old Hebrew
0277 Danish	0423 Greek Old	Danish/Norwegian	Hebrew
0287 Danish Alt	0875 Greek New	Danish Alt	Farsi/Latin
0278 Finnish	0871 Icelandic	Finnish/Swedish	Greek Old
0288 Finnish Alt	0290 Japan Kata	Finnish Alt	Greek New
0297 French	0870 Latin 2	French	Arabic
0500 Internat. 5	0838 Thai	International	Turkish
0280 Italian	1026 Turkish	Italian	Turkish Old
0281 Japan. Eng	0890 Yugos. Old	Japanese Eng.	Latin2/ROECE
0282 Portuguese	1097 Farsi	Japanese Katak.	Yugoslavian
0284 Span Speak	1025 Cyrillic		
0289 Span. Alt	0905 Turk. Old		
0500 Swiss Bil	0256 Intern. 1		
	0924 Latin 9		

Specifies the print language used by the printer. Character sets are shown in detail in the *Character Sets Reference Manual*.

Translation Table

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 (see page 77).

Active Char Set

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

PA1

PA1 is only valid when the printer is in the offline state and the coax Systems 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.

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PA2

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.

Buffer Reprint

This option is valid only when the printer is printing in 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.

Device ID

This parameter defines the printer emulation, as follows:

- 4234

- 3287

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

SCS Buffer Control

Allows the printer to send a print (order) complete status to the host before the printer is actually done printing all data. If this parameter is set for Don't Wait, the printer may print at a slightly faster rate. However, if a fault occurs, there is the possibility of data loss. This option is valid only when the printer is in SCS mode.

- **Don't Wait**. The printer notifies the host it is ready for more data as soon as the input data buffer has been sent to the print engine.

- **Wait Until Done**. The printer waits until it has completed printing the buffer before notifying the host it is ready for more data.

Early Print Complete

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.

- **Disable**. The printer will suppress the Early Print Complete response until all printing is complete.

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

NOTE: When an Early Print Complete is enabled and an error occurs, you may lose data.

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Cancel IGP/DCU

- **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.

PTX Transparent Control

Lead-in Chars

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: _

Alt. Set 80-9F

- **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.

Change Case

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

SCS (Systems Network Architecture Character String) Mode is controlled by the host computer.

Set Text Orientation

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 put ONLINE.

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Image Buf Size

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.

Intervention Req

- **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.

Compatibility Options

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

```
┌─────────────────┐
│ Compatibility   │
│ Options         │
│ (from page 150) │
└─────────────────┘
```

CR at MPP+1	NL at MPP+1	Position Aft FF (4234 only)	Last Char=FF	Null Suppression	FF Validity
On*	On*	Off*	On*	Off*	Off*
Off	Off	On	Off	On	On

Auto Skip at End	FF After Job	CR, EM & NL (3287 only)
Off*	Off*	On*
On	On	Off
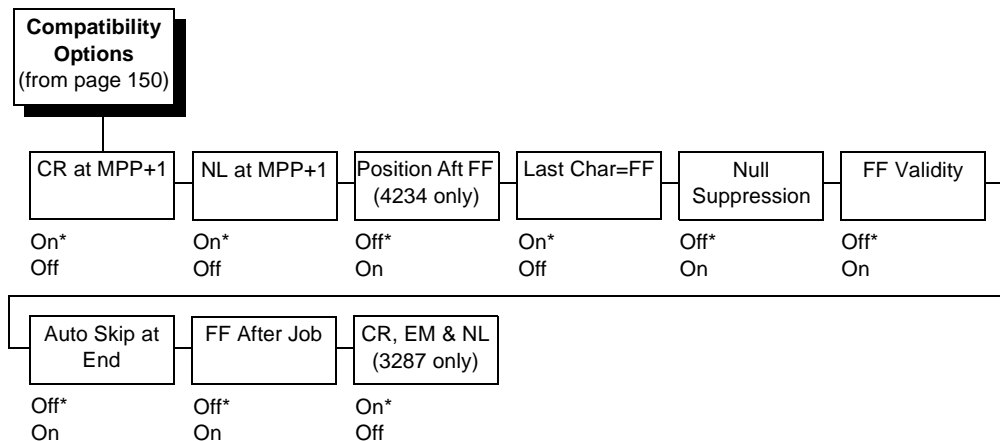
CR at MPP+1

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.

NL at MPP+1

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.

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Position Aft FF (4234 only)

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.

Last Char = FF

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.

Null Suppression

- **Off**. Ignores nulls. The print position does not move.

- **On**. Treats nulls as spaces.

FF Validity

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 space.

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

Auto Skip At End

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.

155

FF After Job

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.

CR, EM, And NL (3287 only)

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

- **On**. Treats the CR, EM and NL commands as control codes.
- **Off**. Treats the CR, EM and NL commands as spaces.

Translate Table

Defines which translate table to use for printing.

- **Default**. Translates data by using the default table of the current character set.

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

Host Override

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.

Format Control

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 IGP/VGL feature, IGP/PGL 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 IGP/VGL feature, IGP/PGL feature, and Hex Transparent control code sequence, in the new position (after horizontal and vertical tabs are executed).

Max. Print Width

Set the maximum print width the printer will print when using a C/T host interface.

- 13.2 inches
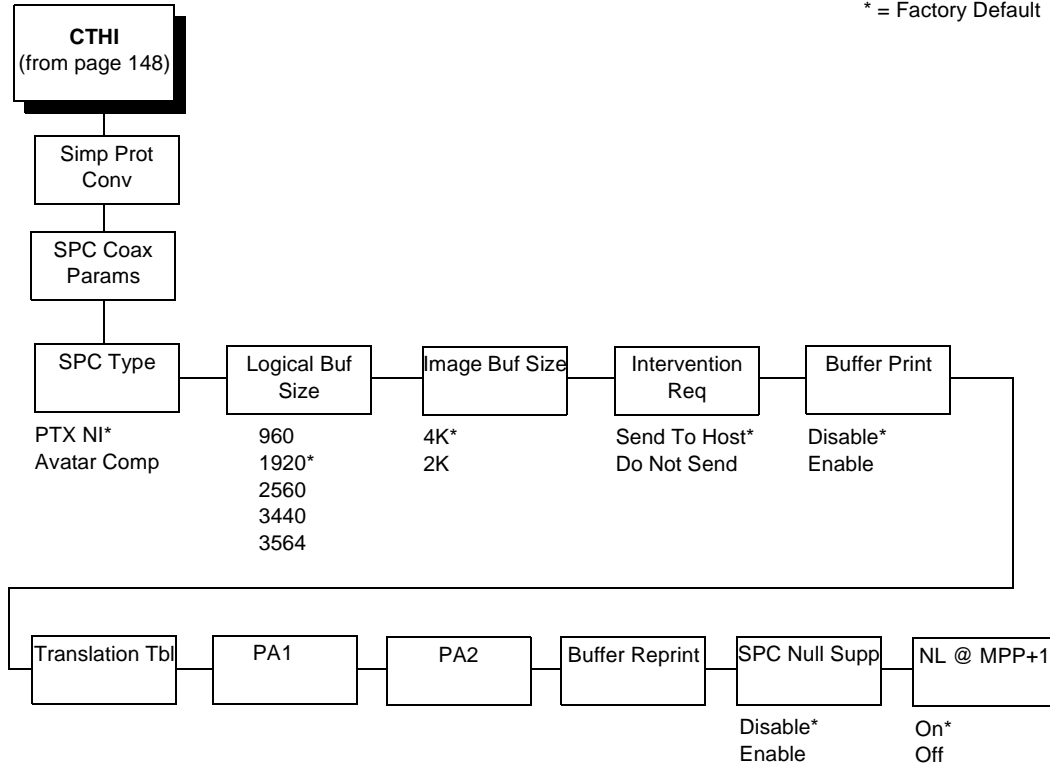- Printer Width (the width of the T4204, or 4.10 inches)

Buffer Print

- **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.

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Twinax Emulation Menu

* = Factory Default

```
CTHI
(from page 148)
   |
Standard*
   |
Twinax
Params
   |
```

Char Set Select	Translation Tbl	Active Char Set	Device ID	Device Address
(see next page)		Secondary Set* Primary Set	4234-2* 5225	1* (0-6)

5225 World Trade	Cancel IGP/DCU	PTX Transparent	Graphic Chek Err	Graphic Chek Cod	LAC Option
Standard Char* Extended Char	Enable* Disable	Lead-in Chars Set 1 <%>* Set 2 ¬¬$ Set 3 _%_ Alt. Set 80-9F Printable* Control Code	Enable* Disable	60* (40-FE hex)	Enable* Disable

LAC Approx.	Set Text Orientn	Host Override	Format Control	Max. Print Width	Buffer Print
On* Off	Control By Host* Left to Right Right to Left	Disable* Enable	Disable* Enable	13.2 inches* Printer Width	Disable* Enable

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Char Set Select

* = Factory Default

Char Set Select
(from page 158)

Primary Sets

Secondary Sets

0037 English US*	0424 Hebrew	English US*	Spanish Speak.
0037 Eng Nether	0803 Hebrew Old	Austrian/German	English UK
0500 Swiss Bil	0420 Arabic	Belgian	Old Hebrew
0500 Belg. New	0880 Cyril. Old	Brazilian	Hebrew
0273 Austr/Germ	0423 Greek Old	Canadian French	Farsi/Latin
0274 Belg. Old	0875 Greek New	Danish/Norweg.	Greek Old
0275 Brazilian	0871 Icelandic	Finnish/Swedish	Greek New
0260 Canad Fren	0290 Japan Kata	French	Arabic
0277 Danish	0870 Latin 2	Italian	Turkish
0278 Finnish	0838 Thai	Japanese Eng.	Latin2/ROECE
0297 French	1026 Turkish	Japanese Katak.	Yugoslavian
0280 Italian	0890 Yugos. Old	Portuguese	Multinational
0281 Japan. Eng	1097 Farsi	Spanish	
0282 Portuguese	1025 Cyrillic		
0284 Span Speak	0256 Intern. 1		
0285 English UK	1112 Balt Mult		
0892 OCR A	0924 Latin 9		
0893 OCR B	0500 Internat 5		

Specifies the print language used by the printer. Character sets are shown in detail in the *Character Sets Reference Manual*.

Translation Table

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 (see page 77).

Active Char Set

This option selects which group of character sets (Primary or Secondary) will be active.

Device ID

This parameter defines the printer emulation, as follows:

• 4234-2

• 5225

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

Device Address

Allows you to set the device address from 0 through 6. The host directs data and commands on the twinax line to a specific device based on its unique device address. After the address has been changed, a POR status is sent to the host.

5225 World Trade

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

Cancel IGP/DCU

- **Enable**. Cancels all buffers when a job is put on hold from the host, or 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 the CANCEL key is pressed.

PTX Transparent

Lead-in Char.

You can enable additional features that are not available in standard Twinax 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: _

Alt. Set 80-9F

- **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.

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Graphic Chek Err

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.

Graphic Chek Code

Specifies the replacement character to print in place of any unprintable character that is received from the host. Choose a character from hex 40 through hex 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.

LAC Option

Allows the host system to load alternate character images into the printer. This may be used for designing graphics, bar codes, and charts, or for printing in foreign languages.

- **Enable**. Prints the LAC character as defined.

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

LAC Approx.

Specifies whether or not to use the LAC Approximation feature. For more information about the LAC Approximation feature, refer to the *Coax/Twinax Programmer's Reference Manual*.

- **On**. (default) Always converts the emulated character cells to standard cells.

- **Off**. Passes the character data through the printer without conversion.

Set Text Orientn

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

- **Control By Host**.

- **Left To Right**.

- **Right To Left**.

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Host Override

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.

NOTE: Host margin and tab settings will take precedence, whether or not Host Override is enabled.

Format Control

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 IGP/VGL feature, IGP/PGL feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).

- **Enable**. Does not reflect distance, generated by the IGP/VGL feature, IGP/PGL feature, and Hex Transparent control code sequence, in the new position (after absolute and relative move commands are executed).

Max. Print Width

Set the maximum print width.

- 13.2 inches
- Printer Width (the width of the T4204, or 4.10 inches)

Buffer Print

- **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.

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SPC Coax Params

* = Factory Default

```
┌──────────────┐
│    CTHI      │
│(from page 148)│
└──────┬───────┘
       │
┌──────┴───────┐
│  Simp Prot   │
│    Conv      │
└──────┬───────┘
       │
┌──────┴───────┐
│  SPC Coax    │
│   Params     │
└──────┬───────┘
       │
┌──────┴─────┐  ┌────────────┐  ┌────────────┐  ┌────────────┐  ┌────────────┐
│  SPC Type  │──│ Logical Buf│──│Image Buf Size│─│ Intervention│─│Buffer Print│
│            │  │    Size    │  │            │  │    Req      │  │            │
└────────────┘  └────────────┘  └────────────┘  └────────────┘  └────────────┘

PTX NI*         960             4K*             Send To Host*    Disable*
Avatar Comp     1920*           2K              Do Not Send      Enable
                2560
                3440
                3564
```

```
┌────────────┐  ┌────────┐  ┌────────┐  ┌──────────────┐  ┌────────────┐  ┌────────────┐
│Translation Tbl│ │  PA1   │─│  PA2   │─│Buffer Reprint│──│SPC Null Supp│─│ NL @ MPP+1 │
└────────────┘  └────────┘  └────────┘  └──────────────┘  └────────────┘  └────────────┘

                                                          Disable*          On*
                                                          Enable            Off
```

SPC Type

• **Avatar Compatible.** This option causes the printer to line wrap at 132 characters despite the current print density allowing more characters per line.

• **PTX NI (Printronix Non-impact)**. This option causes the printer to not line wrap at 132 characters.

Logical Buff Size

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.

Image Buff Size

This option refers to the printer base buffer size. This size must be set to a value greater than or equal to the Logical Buffer Size.

Intervention Req

• **Send to Host**. The printer sends a signal to the host computer when the CANCEL key is pressed or a printer fault or hold mode time-out occurs.

• **Do Not Send**. No signal will be sent to the host computer.

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Buffer Print

- **Disable**. The printer will print normally.

- **Enable**. The printer prints the EBCDIC data and control codes received from the host as hex values.

Translation Tbl

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

PA1

PA1 is only valid when the printer is in the OFFLINE state and the coax Systems 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 online. Refer to the *Coax/Twinax Programmer's Reference Manual* for more information about SCS.

PA2

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 online.

Buffer Reprint

This option is valid only when the printer is printing in 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.

SPC Null Suppression

- **Disable**. Ignores nulls. The print position does not move.

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

NL at MPP+1

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.

SPC Twx Params

* = Factory Default

CTHI
(from page 148)

Simp Prot Conv

SPC Twx Params

Device Address	SPC Type	Translation Tbl	Buffer Print

1*
(0-6)

Disable*
Enable

Mode PTX NI*	MODE 219	MODE P5000	MODE IBM
SPC Char Set	Printer Type	SPC Char Set	SPC Char Set
0500 Internat 5*	Impact/P-Series*	0500 Internat 5*	0500 Internat 5*
0037 English US	STD Centronics	0037 English US	0037 English US
0273 Austr/Germ	IGP/VGL	0273 Austr/Germ	0273 Austr/Germ
0274 Belg. Old	IGP/PGL	0274 Belg. Old	0274 Belg. Old
0275 Brazilian	SFCC Char	0275 Brazilian	0275 Brazilian
0260 Canad Fren	Logical Not*	0260 Canad Fren	0260 Canad Fren
0277 Danish	Caret (^)	0277 Danish	0277 Danish
0278 Finnish	User Defined	0278 Finnish	0278 Finnish
0297 French	Usr Defined HTRN	0297 French	0297 French
0280 Italian	Start Code 1 5F*	0280 Italian	0280 Italian
0281 Japan. Eng	(0-FF)	0281 Japan. Eng	0281 Japan. Eng
0290 Japan Kata	Start Code 2 5F*	0290 Japan Kata	0290 Japan Kata
0282 Portuguese	(0-FF)	0282 Portuguese	0282 Portuguese
0284 Span Speak	Stop Code 5B*	0284 Span Speak	0284 Span Speak
0285 English UK	(0-FF)	0285 English UK	0285 English UK
SFCC Char	EVFU	SFCC Char	SFCC Char
Set 1 <%>*	Enable*	Set 1 <%>*	Set 1 <%>*
Set 2 ^^$	Disable	Set 2 ^^$	Set 2 ^^$
Set 3 _%_	SPC Char Set	Set 3 _%_	Set 3 _%_
User Defined	Multinational*	User Defined	User Defined
Usr Defined HTRN	Austrian/German	Usr Defined HTRN	Usr Defined HTRN
Start Code 1 5F*	Belgian	Start Code 1 5F*	Start Code 1 5F*
(0-FF)	Canadian French	(0-FF)	(0-FF)
Start Code 2 5F*	Danish/Norweg.	Start Code 2 5F*	Start Code 2 5F*
(0-FF)	French	(0-FF)	(0-FF)
Stop Code 5B*	Spanish	Stop Code 5B*	Stop Code 5B*
(0-FF)	English US	(0-FF)	(0-FF)

Device Address

Allows you to set the device address from 0 through 6. The host directs data and commands on the twinax line to a specific device based on its unique device address. After the address has been changed, a POR status is sent to the host.

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SPC Type

Allows you to select a specific type of Simple Protocol Converter (SPC) Twinax emulation. Mode PTX NI is for Coax/Twinax interfaces, MODE 219 for Model 219 protocol converter, MODE P5000 for Printronix protocol convertor, and MODE IBM for the IBM protocol converter.

Printer Type

Determines the SPC Twinax emulation "Mode". When set to Std Centronics, IGP/VGL, or IGP/PGL, the Set Line Density and Set Print Density commands are translated into a Carriage Return (CR) and vertical format commands are ignored unless the EVFU is enabled.

SFCC Char

Determines what character is printed when an EBCDIC Logical Not character ¬ (hex 5F) is received from the host.

EVFU

- **Enable**. The EVFU parameter allows vertical format control by the host in all four printer type modes.

- **Disable**. Vertical format control is only allowed in IMPACT/P-SERIES mode.

SPC Char Set

Allows you to select the print language character set.

Translation Table

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

Buffer Print

- **Disable**. The printer will print normally.

- **Enable**. The printer prints the EBCDIC data and control codes received from the host as hex values.

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Loading Flash Memory

Printer emulation and operating system software are loaded into flash memory at the factory, but you will install software in some situations:

• You buy the PGL/VGL, or Expansion-C/T option after the printer is installed

• You need to upgrade printer software

• You have replaced the printer Controller PCBA

• You have replaced the flash memory SIMM

Emulation and operating system software are stored as a compressed file on 3.5 inch floppy diskettes. These files are "executable"—you will expand them and copy them into printer flash memory.

Flash memory is contained in two ICs soldered on to the Controller PCBA, and an 80-pin 2MB SIMM at location U38, providing a total of 4MB of flash memory for the printer.

Downloading Software To Flash Memory

IMPORTANT   **When downloading emulation and operating system software to the printer, all other optional font files, customer-supplied logos, setup files, and TIFF files will be erased. You will then need to reload those files. Before starting a download procedure, be sure that you have all the necessary files on hand.**

You can download emulation and operating system software through the Ethernet, serial, or parallel port of the printer.

1. If the printer has an Ethernet interface card, refer to your *PrintNet User's Manual* for download instructions. You are finished with this procedure.

2. Make a printout of *all* saved configurations. (Installing new software erases all saved configurations. You will use the printouts to restore printer configuration.)

3. Set the printer power switch to O (off).

4. If the printer is already connected to the serial or parallel port of a computer capable of running an MS-DOS based PKZIP® self-extracting file, go to step 11. If not, go to step 5.

5. Unplug the AC power cord from the printer.

6. Disconnect all data input cables from the printer interface.

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7. Connect a parallel data cable to the LPT1 port or a serial data cable to the COM1 port of an IBM-compatible computer that is using the PC-DOS™ or MS-DOS operating system.

NOTE: You can connect the cable to the LPT2 port if the LPT1 port is already in use. The load commands are different if you use this port, as described in the note after step 26.

8. Connect the data cable to the appropriate I/O port of the printer.

9. Plug the AC power cord into the printer.

10. Power on the computer.

11. Create a directory on your computer hard drive where you will store the recombined files from the emulation diskettes by typing the following at the DOS prompt:

    MD DOWNLOAD<return>

12. Make the newly created directory the "active" directory by typing the following at the DOS prompt:

    CD DOWNLOAD<return>

13. Insert the last diskette in the series (e.g., 2 of 2, 3 of 3, etc.) into diskette drive A (or B) of the computer.

14. Get the name of the compressed file on the diskette by typing the following at the DOS prompt:

    DIR A:<return> (If the diskette is in drive B, type DIR B:<return>)
    The compressed file on the diskette takes the form *FILENAME.ZIP*, where the filename is a six digit number (e.g., 123456.zip).

15. At the DOS prompt type:

    A:\PKUNZIP A:*FILENAME* (Replace A: with B: if you are using the B dirve), where *FILENAME* is the six digit number you noted in the previous step.

16. The PKUNZIP® program will execute, and the following message will appear on the computer screen:

    Insert disk #1 - Press a key when ready

17. Remove the diskette in the disk drive and insert the diskette labeled

    Disk 1 of 2 (or 1 of 3, etc.)

18. Press the <return> key. After the file is decompressed to the hard drive, the following message will appear on the computer screen:

    Insert disk #2 - Press a key when ready

19. Remove the diskette in the disk drive and insert the diskette labeled

    Disk 2 of 2 (or 2 of 3, etc.)

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20. Press the <return> key. If there are only two diskettes for the emulation, you will be returned to the DOS prompt when the decompression is complete. If there are three diskettes, you will be asked to insert disk #3 and press a key.

21. When all diskettes have been decompressed, type the following at the DOS prompt:

    DIR<return>
    You will see a directory listing containing the file ***FILENAME.EXE***, where the filename is the six digit number (e.g., 123456.exe) you noted above.

22. On the printer control panel, press and hold down the **PAUSE + FEED** keys while powering the printer on. Continue holding the **PAUSE + FEED** keys down.

NOTE: The port default is CENTRONICS; this is the standard load through the parallel port. If you want to use the default, continue at step 26.

23. When you see "WAITING FOR PROGRAM DOWNLOAD" on the LCD, press the ▶ **(NEXT)** key; "SELECT DOWNLOAD PORT=DATAPRODUCT" appears on the LCD.

24. Press ▶ **(NEXT)** again to cycle through the download ports available in the printer:

    DATAPRODUCT (parallel)
    CENTRONICS* (parallel) (default port)
    RS232-9600 (RS-232 serial, 9600 baud)
    RS232-19.2K (RS-232 serial, 19200 baud)
    RS232-38.4K (RS-232 serial, 38400 baud)
    RS232-115K (RS-232 serial, 115000 baud)
    RS422-9600 (RS-422 serial, 9600 baud)
    RS422-19.2 (RS-422 serial, 19200 baud)
    RS422-38.4K (RS-422 serial, 38400 baud)
    RS422-115K (RS-422 serial, 115000 baud)

25. When the printer download port you want to use is displayed on the LCD, press **ENTER.** "WAITING DOWNLOAD / PORT = <*your selection*> appears on the display.

26. When you see "WAITING FOR PROGRAM DOWNLOAD" on the LCD, at the DOS prompt on the computer type:

    FILENAME.EXE -pb<return>
    where FILENAME.EXE is the compressed file you noted in step 21. This command decompresses the file on the hard drive and copies it as a binary file into the flash memory on the printer controller board.

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NOTE: If you are loading the file using the LPT2 port on the computer, enter the following DOS command:
FILENAME.EXE -pb 2 <Return>

The 9600 baud rate is the only selection older versions of DOS can use. The baud rate information entered in the following DOS commands must match the selection you made in step 25.

If you are loading the file through the printer serial port, enter the following DOS commands:
MODE COM1:9600,N,8,1,P<Return>
FILENAME.EXE -pbc1<Return>

27. While the file is copied into memory, the printer LCD informs you of the load process and status. (LCD messages are listed in Table 6, page 173.)

28. When the new program has successfully loaded into memory and the printer has reset itself, set the printer power switch to O (off).

29. Unplug the AC power cord from the printer.

30. Remove the diskette from the computer and store it with the printer.

31. Power off the computer.

32. If you had to install a data cable to the computer and printer in step 7, disconnect it from the computer and printer.

33. Reconnect the customer's data input cable(s) to the printer, if required.

34. Return the printer to normal operation.

35. Using the configuration printout(s) you made in step 2, reconfigure the printer.

Downloading Optional Font Files To Flash Memory

Optional font files are stored on 3.5 inch floppy diskettes that contain filenames comprised of a part number with a **.DWN** extension. You will install the diskette on your IBM-compatible computer and use either the parallel or serial port to download the desired font file(s) to the printer's flash memory.

You may load the optional font files through either the serial or parallel port of the printer. The load commands are different, depending on the printer port you use. These differences are explained within the procedures below.

1. Set the printer power switch to O (off).

2. Connect a parallel data cable to the LPT1 port or a serial cable to the COM1 port of an IBM-compatible computer that is using the PC-DOS or MS-DOS operating system.

NOTE: You can connect the cable to the LPT2 port on the computer if the LPT1 port is already in use. The load commands are different if you use this port, as described in the notes after step 14.

3. Verify that the data cable is connected to the appropriate I/O port on the printer and to the host computer.

4. Power on the computer and allow it to boot up.

5. Once the computer is booted up, insert the optional font diskette into diskette drive A (or B) of the computer.

6. Make the diskette drive the active drive by typing the following at the DOS prompt:

   A:<Return> (if the diskette in drive B, type **B:**<Return>)

7. List the contents of the diskette at the DOS prompt by typing the following:

   A:\> **DIR**<Return>

8. You will view a list of filenames with a **.DWN** extension on them.

   Example:

   94021.DWN
   94022.DWN
   94023. DWN

   Write down the complete filename with the .DWN extension of each file you want to download to the printer.

NOTE: The numeric portion of the filename will match the numbers of the font typefaces listed in Appendix E of the PGL and VGL *Programmer's Reference Manuals* and provide you with a description and print sample of the typeface.

9. On the printer control panel, press and hold down the **PAUSE + FEED** keys. Without releasing the keys, power the printer on. Continue holding the **PAUSE** and **FEED** keys down for 5 seconds, then release.

NOTE: The printer default port is CENTRONICS; if you want to use this port, continue to step 14.

10. When you see "WAITING FOR PROGRAM DOWNLOAD" on the LCD, press the **NEXT** key; "SELECT DOWNLOAD PORT = RS232-9600" appears on the LCD.

11. Press the **NEXT** key again to cycle through the download ports available in the printer:

   DATAPRODUCT (parallel)
   CENTRONICS* (parallel) (default port)
   RS232-9600 (RS-232 serial, 9600 baud)
   RS232-19.2K (RS-232 serial, 19200 baud)
   RS232-38.4K (RS-232 serial, 38400 baud)
   RS232-115K (RS-232 serial, 115000 baud)
   RS422-9600 (RS-422 serial, 9600 baud)
   RS422-19.2 (RS-422 serial, 19200 baud)
   RS422-38.4K (RS-422 serial, 38400 baud)
   RS422-115K (RS-422 serial, 115000 baud)
   DEBUG

12. When the printer download port you want to use is displayed on the LCD, press **ENTER**. "WAITING DOWNLOAD / PORT" = <your selection> appears on the display.

13. When you see "WAITING FOR PROGRAM DOWNLOAD" on the LCD, at the DOS prompt on the computer type:

    A:\> **COPY /B** *FILENAME***.DWN LPT1** <Return>

NOTE: If you are loading the file using the LPT2 port on the computer, type the following DOS command:

    A:\> **COPY /B** *FILENAME***.DWN LPT2** <Return>

If you are loading the file using the serial port on the computer, type the following DOS commands:

    A:\> **MODE COM1:9600,N,8,1,P** <Return>
    COPY /B *FILENAME***.DWN COM1**<Return>

The 9600 baud rate is the only selection older versions of DOS can use. The baud rate information entered in the above DOS commands must match the selection you made in step 12.

You can download the optional font files one at a time by entering one file name per DOS *copy* command or you can copy multiple files in one *copy* command.

To download one file at a time, enter the following at the DOS prompt, for example:

    A:\> **COPY /B** *FILENAME***.DWN LPT1**<Return>

To download multiple files, enter the following at the DOS prompt, for example:

    A:\> **COPY /B** *FILENAME***1.DWN+***FILENAME2***.DWN+… LPT1**<Return>

NOTE: If you download one file at a time, you will need to cycle power and hold the PAUSE + FEED Keys down for each file because the printer resets itself after each file. If you have multiple files to download, it is recommended that you follow the instructions for downloading multiple files.

14. While the font file is copied into flash memory, the printer LCD informs you of the load process and status. (See Table 6 below.) When the new file is successfully loaded into memory, the printer will reset itself and go Online.

15. You can verify that the optional fonts have been downloaded, by performing a configuration printout or by entering the configuration menu and viewing the font files on the LCD. The new files will appear under Installed Fonts in the FONT MEMORY menu with the same part number file name you selected, but with an **AGFA** prefix.

NOTE: The optional font typefaces cannot be selected via the printer control panel, they can only be selected via software command from the host.

16. Press the **PAUSE** key to place the printer Online and return the printer to normal operation.

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Table 6. Flash Memory Message Guide

Message	Explanation	Required Action
CLEARING PROGRAM FROM FLASH	The program successfully loaded into printer RAM and the checksum matched. The old program is now being deleted from flash memory.	None
TESTING HARDWARE PLEASE WAIT	Printer status message while downloading.	None
DIAGNOSTICS PASSED	The printer passed its memory and hardware initialization tests.	None
ERROR: DC PROGRAM NOT VALID	Printer cannot find the data controller program or the validation checksum is corrupted.	Download the program again: Power off the printer and start over at 9. If the message occurs again, replace the flash SIMM at U38 or Controller PCBA.
ERROR: DRAM AT ADDRESS *XXXXXXXX*	The printer found a defective memory location.	Reseat or replace DRAM SIMM at U33. Replace Controller PCBA.
ERROR: FLASH DID NOT PROGRAM	The printer encountered an error trying to program flash memory.	Download the program again: Power off the printer and start over at 9. If the message occurs again, replace the flash SIMM at U38 or replace the Controller PCBA.
ERROR: FLASH NOT DETECTED	The printer could not find any flash memory.	Reseat or replace Flash SIMM at U38. Flash SIMM must be present. If the message occurs again, replace the Controller PCBA.
ERROR: FLASH TYPE NOT SUPPORTED	The printer does not recognize the type of flash memory installed.	Replace the Flash SIMM at U38 with the recommended type. Contact your authorized service representative.
ERROR: NO DRAM DETECTED	The printer could not find any DRAM.	Reseat or replace the DRAM SIMM at U33. If the message occurs again, replace the Controller PCBA.

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Table 6. Flash Memory Message Guide

Message	Explanation	Required Action
ERROR: NVRAM FAILURE	The non-volatile memory has failed.	Replace Controller PCBA.
ERROR: PROGRAM NEEDS MORE DRAM	The printer requires more DRAM memory in order to run the downloaded program.	Reseat or replace the DRAM SIMM at U33. If the message occurs again, replace the Controller PCBA.
ERROR: PROGRAM NEEDS MORE FLASH	The printer requires more flash memory in order to run the downloaded program.	Reseat Flash SIMM at U38. Replace the Flash SIMM. If the message occurs again, replace the Controller PCBA.
ERROR: PROGRAM NOT COMPATIBLE	The printer is not compatible with the downloaded program.	Use the correct emulation software option(s) for this model printer.
ERROR: PROGRAM NOT VALID	The printer does not see a program in flash memory.	There is no program in printer memory. Go to step 2.
ERROR: SECURITY PAL NOT DETECTED	The security PAL is not present or has failed.	Check the security PAL at location U11 on the Controller PCBA. If the PAL is absent, install correct PAL. If correct security PAL is present, replace the Controller PCBA.
ERROR: SHORT AT ADDRESS *XXXX*	Hardware failure in DRAM or Main PCBA controller circuitry.	Replace U33 DRAM SIMM. If message occurs with new DRAM, replace the Controller PCBA.
ERROR: WRITING TO FLASH	Hardware or software fault in flash memory.	Download the program again: Power off the printer and start over at 9. If the message occurs again, replace U38 Flash SIMM or Controller PCBA.

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Table 6. Flash Memory Message Guide

Message	Explanation	Required Action
ERROR: WRONG CHECKSUM	The printer received the complete program but the checksum did not match. The data were corrupted during download.	Download the program again: Power off the printer and start over at 9. If the message occurs again, replace U38 Flash SIMM or Controller PCBA.
LOADING PROGRAM FROM PORT XX%	The new program is loading into printer RAM. XX indicates how much of the program has loaded.	None
LOADING PROGRAM INTO FLASH	The printer has deleted the previous program from flash memory and is loading the new program into flash memory.	None
RESETTING PLEASE WAIT	The printer finished loading the program into flash memory and is automatically resetting itself.	None
RESTORING BOOT CODE	Normal download initialization message.	None
SECURITY CODE VIOLATION	The software running or being downloaded does not match the security PAL code.	Install the correct PAL at U11 or use the correct program. (PAL and program must match.)

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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.

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 10Base-T

In addition to descriptions for the multi-line interfaces, this chapter also provides instructions for configuration of terminating resistors for the parallel interfaces.

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Centronics Parallel Interface

The length of the data cable from the host computer to the printer must not exceed 15 feet (5 meters).

Table 7. Centronics Interface Connector Pin Assignments

Input Signals		Output Signals		Miscellaneous	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**

DATA LINE 1
  Return
	2
	20
		ACKNOWLEDGE
		  Return
			10
			28
				CHASSIS GROUND	17

DATA LINE 2
  Return
	3
	21
		ONLINE
		  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	34,3
					5, 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				

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Centronics Parallel Interface Signals

Table 8. 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 (see page 80).
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.

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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 7). 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 9 lists each of the signals associated with the corresponding pins on the IEEE 1284 interface. Descriptions of the signals follow.

Table 9. IEEE 1284 Signals

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

Table 9. IEEE 1284 Signals

Pin	Source of Data	Type of Mode		
		Compatible	**Nibble**	**Byte**
26		Signal Ground (Data 7)		
27		Signal Ground (Data 8)		
28		Signal Ground (PError, Select, nAck)		
29		Signal Ground (Busy, nFault)		
30		Signal Ground (nAutoFd, nSelectIn, nInit)		
31	Host	nInit		
32	Printer	NFault	nDataAvail	aDataAvail
33		Not Defined		
34		Not Defined		
35		Not Defined		
36	Host	nSelectIn	1284 Active	1284 Active

> **NOTE:** The length of the data cable from the host computer to the printer
> should not exceed 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.

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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 may need to install resistors with different pull-up and pull-down values.
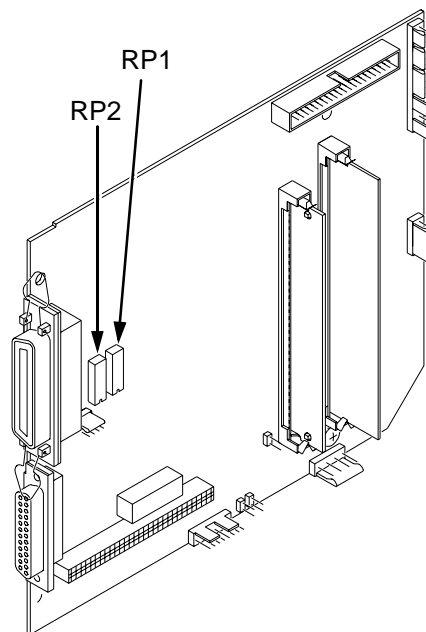
Figure 6. Resistor Locations

The shipping kit for this printer includes 220 ohm pull-up and 330 ohm pull-down alternate terminating resistors. If you install the 220 ohm pull-up resistor, you must also install the 330 ohm pull-down resistor.

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Table 10 lists the three terminating resistor configurations you can install:

Table 10. Terminating Resistor Configuration

Configuration	Pull-Down (RP1)	Pull-Up (RP2)
Factory Default	1K ohm	470 ohm
Alternate 1	330 ohm	220ohm
Alternate 2	none	1K ohm

Removal And Installation

The procedure for removing and installing terminating resistors is provided in your *Maintenance Manual.*

IMPORTANT **This is an involved maintenance procedure; only a trained technician should perform this procedure.**

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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.)

RS-232

Table 11. RS-232 Serial Interface Connector Pin Assignments

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				

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.

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

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

RS-422

Table 12. RS-422 Serial Interface Connector Pin Assignments

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

+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.

5 *Diagnostics And Troubleshooting*

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 194).

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. See Chapter 3, "Configuring The Printer," for instructions.

The Test Print program can be enabled from the printer through the TEST key on the Primary Control Panel or through the Secondary Control Panel 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 set up for the type of media installed. (See the Printer Control menu selections on "Printer Control Menu" on page 91).

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.

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 the cutter option:
  The printer must stop and wait for the cutter to execute the cutting cycle.

- 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**

  These electrical signal are controlled by the logic states on pins 4 and 20 of the serial interface connector J2 (at the back of the printer). The signals will go either low or high, depending on the configuration setting, when the printer is ready to receive data.

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The signals will go either low or high, depending on the configuration setting, 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 and character hex dump modes 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 Printronix 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 configuration settings may be entered through the main menu HOST INTERFACE function, which is accessed through the secondary control panel. (See Chapter 3, "Configuring the Printer" for complete instructions.)

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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 also 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 PRINTER CONTROL menu.
- Setting the print intensity to a higher value with the Print Intensity function, accessed via the host or through the PRINTER 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 printed form, the printhead should be cleaned with a printhead cleaning pen or a cotton swab moistened with isopropyl alcohol (see Figure 7).

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).
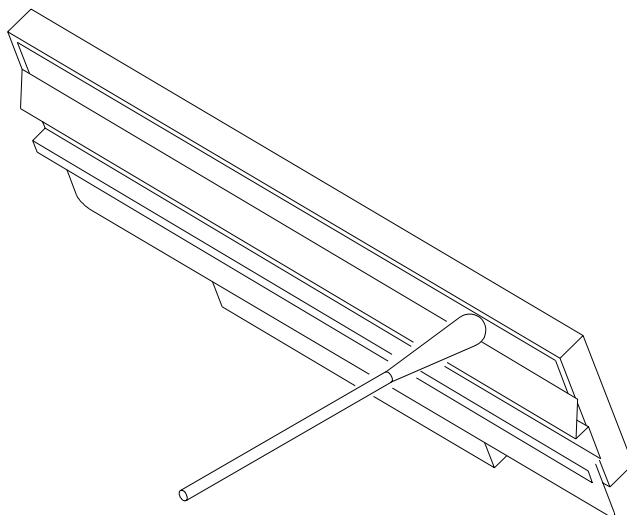
Figure 7. Cleaning the Printhead

Other Printer Problems

- **Smears or voids in printed image**

  Possible causes include:

  - Dirty printhead. Clean the printhead, as described in the previous section.

  - Printhead temperature is too high. Use software control to adjust the heat setting or change the Print Intensity value through the PRINTER CONTROL menu. This function is accessed through the secondary control panel. (See Chapter 3, "Configuring The Printer," for complete instructions.)

  - Incorrect ribbon/media combination is being used. Be sure to use the correct ribbon type. The use of genuine Printronix Supplies is highly recommended to ensure the best possible print quality.

  - The ribbon has a crease or fold across the surface. Smooth out the ribbon to remove the crease. Perform the Ribbon Wrinkle adjustment procedure in the *T4204 Maintenance Manual*. Reduce the Print Speed setting using the PRINTER CONTROL menu. You can access the menu through the secondary control panel. (See Chapter 3, "Configuring The Printer," for complete instructions.)

- **Advances several labels when FEED button is pressed**

  Possible causes include:

  - Labels were loaded incorrectly. Refer to the loading instructions on the inside cover of the printer, or see "Loading Roll Media" on page 29.

  - The PRINTER CONTROL menu Page Length value is set greater than the actual length of the Transmissive or Reflective media currently installed.

  - The media sensor is not horizontally positioned directly under the Transmissive notch or hole, or if Reflective media is installed, the media sensor is not positioned under the black stripe.

  - The Run Calibrate procedure was never performed.

  - The media sensor is out of adjustment or defective. Call your authorized Printronix service representative.

- **Prints strange characters instead of the correct label format**

  Possible causes include:

  - Printer serial baud rate setting does not match the host baud rate. Reset the printer via software, or turn the printer off and then on.

  - Printer serial host interface set for 8 data bits but the transmitting device is set for 7 data bits (or vice-versa). The current setting may be viewed on the front-panel message display and new settings may be entered through the main menu HOST INTERFACE function. This is accessed through the secondary control panel. (See Chapter 3, "Configuring The Printer," for complete instructions.)

- **Printer advances media, but ribbon does not advance**

  Possible causes include:

  - Ribbon Supply spindle has jammed.

  - The ribbon is not attached to the cardboard tube on the take-up spindle.

  - A bad ribbon/media combination is resulting in insufficient friction between media and ribbon. Verify that the correct ribbon is being used.

  - Ribbon broke, but portion of ribbon is covering the ribbon sensor, preventing a RIBBON FAULT error message.

- **Print quality is good but printer skips every other label**

  Possible causes/solutions include:

  - The label is formatted too close to the top edge of the form. Leave white space equal to eight dot rows at the top of the label.

  - Slightly reduce the Page Length value in the PRINTER CONTROL menu.

  - Enable the PRINTER CONTROL menu Clip Page.

  - The Logical Page Length is greater than the Physical Page Length.

  - The Host Forms Length value is greater than the Physical Page Length.

- **Print is light on right side of label**

  Possible causes include:

  - Media width adjustment cam is set for a narrower width than the width of the media being used.

  - The platen is worn on the right side.

  - Printhead dirty.

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- **Printer fails to turn on.**

Possible causes include:

- Faulty AC wall outlet.
- Faulty AC cord.
- Blown fuse. Call your authorized Printronix service representative.
- Bad printer power switch. Call your authorized Printronix service representative.

- **With the LCD Message Display indicator illuminated, the printer appears to be working, but nothing is printed.**

    Possible causes/solutions include:

    - Verify that the labels are the correct type (direct thermal).
    - Check that the roll is loaded with the direct thermal side facing up.
    - Check that the transfer ribbon is correctly routed and has the ink side out.
    - Check that the printhead assembly is properly closed by pressing down on both sides of the assembly.
    - Check that the PRINTER CONTROL menu Print Intensity is set to the correct value.
    - Check that PRINTER CONTROL menu Page Width value does not exceed the media width installed.

- **Printing is faded or poor quality.**

    Possible causes/solutions include:

    - Clean the printhead with a cleaning pen or a cotton swab soaked in alcohol.
    - Adjust print speed and intensity in software.
    - Verify that the PRINTER CONTROL menu Print Speed and Intensity are correct.
    - Check that the printhead assembly is properly closed by pressing down on both sides of the assembly.
    - Verify that the media and ribbon are the proper match.
    - Verify that the correct side of the media is facing the printhead.

- **Printing stops and ONLINE status indicator flashes.**

    Possible causes/solutions include:

    - Possible problem with label gap sensor.
    - Possible problem with label stock. Gap between the bottom of a label and the top of the next label should be at least 1/8 inch. Use only Printronix approved labels and tags.

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- Possible label jam.

- Check that the transfer ribbon and label stock are routed correctly.

- Possible software problem.

- **Printer cuts (melts) through the transfer ribbon. The ribbon is advancing at the same rate as the label stock.**

  Possible causes/solutions include:

  - Verify that the software has set the printing heat setting to the proper level.

  - Verify that the PRINTER CONTROL menu Print Intensity value is set to the correct value.

- **ONLINE status light is flashing.**

  Possible causes/solutions include:

  - Check for Out-of-Media condition or missing labels in the middle of a roll.

  - Check that the ribbon and label stock are correctly routed.

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 detect 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 13.

Displayed faults fall into one of two categories:

- Operator correctable
- Field service required

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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 CLEAR key to clear the error message and status indicator and resume printing. If the fault message reappears, contact your authorized service representative.

NOTE: The *Maintenance Manual* provides more detailed information and procedures for resolving fault conditions. However, many of the procedures described there must be performed only by 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 may try two steps to clear the fault before 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 CLEAR 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.

Table 13. LCD Message Troubleshooting

Displayed Message	Can User Correct?	Explanation	Solution
BUFFER OVERFLOW	Yes	Host sent data after the printer buffer was full. (serial interface)	Check your serial host interface parameter settings; if necessary, change them so they match the settings of the attached host.
BUFFER OVERRUN	Yes	Receive overrun. (serial interface)	Check your serial host interface parameter settings; if necessary, change them so they match the settings of the attached host.
CONFIG DOES NOT EXIST/SAVE FIRST	Yes	Attempt was made to Load, Print, Delete or use a configuration as the Power-Up Config. when the configuration was never saved.	Enter the Save Config. sub-menu of the CONFIG. CONTROL menu and save the desired configuration using configurations 1-8 or a named config.
CUTTER FAULT Check Cutter	Yes	1. Cutter option was not able to complete a full cut cycle due to a jam. 2. Cutter PCBA detected current overload and opened circuit breaker on cutter PCBA.	1. Clear obstruction from cutter assembly. 2. Wait a few minutes for cutter circuit breaker to automatically reset. Press CLEAR to clear the fault message and resume printing.
EC SOFTWARE FAIL* See Manual	Yes	Engine control software failure.	Cycle power to the printer. If problem persists, contact your authorized service representative.
FILE EXISTS Enable Overwrite	Yes	Attempt was made to save a file using an existing stored file name.	Enter the File System sub-menu of the MAINT/MISC menu and enable the Overwrite Files feature to overwrite the existing file.
FILE SYSTEM FULL Delete Files	Yes	Insufficient Flash memory available to store file.	Enter the File System sub-menu of the MAINT/MISC menu. Use Delete to delete unwanted files.
FILE SYSTEM FULL Optimize & Reboot	Yes	Insufficient Flash memory available to store file.	Enter the File System sub-menu of the MAINT/MISC menu and use Optimize & Reboot feature.

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Table 13. LCD Message Troubleshooting (continued)

Displayed Message	Can User Correct?	Explanation	Solution
FILE SYSTEM FULL Add Flash	Yes	Insufficient Flash memory available to store file.	Contact your authorized service representative.
FRAMING ERROR	Yes	Serial framing error. (serial interface)	Check your serial host interface parameter settings. If necessary, change them so they match the settings of the attached host.
GAP NOT DETECTED Check Media	Yes	Printer is set for Transmissive or Reflective sensing, but a gap, notch, or stripe is not being detected. Trans Value is set too low or Refl Value is set to high.	1. Check to see that the media installed matches the media sensor selected in the Config. menu. 2. Clean the sensor assembly and paper path. 3. Perform the Run Calibrate procedure described in this manual to improve sensors ability to detect the media in use. 4. Manually enter a new Trans of Refl value in the Calibrate submenu.
LABEL PRESENT Remove Label (see note)	Yes	1. This is the normal message when Peel-off or Tear-off Media Handling has been selected. 2. Label detected at front of the printer by the Label Taken Sensor. Label Taken Sensor gate is in the down, or enabled, position. 3. Incorrect media handling method is selected.	1. Remove the label from the front of the printer to allow the next label to print. 2. Change the Media Handling selection to the correct option. 3. Select Tear-off Strip or Continuous to prevent the printer from stopping for label removal after each label is printed.

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Table 13. LCD Message Troubleshooting (continued)

Displayed Message	Can User Correct?	Explanation	Solution
LOAD PAPER	Yes	The printer does not sense media. 1. Media was not installed or has run out. 2. A break in media has occurred. 3. Media was not routed or installed correctly. 4. Media is installed correctly, but the Transmissive or Reflective sensor is not detecting it. 5. Trans Value may be set too high or Refl Value may be set to low.	1. Install new media. 2. Re-install media through the paper path. 3. Check the media installation procedures beginning on page 28. 4. Perform the Run Calibrate procedure described in this manual to improve sensors ability to detect the media in use. 5. Manually change the value (Trans or Refl) of media for media in use.
OPTION NOT INSTALLED	Yes	Cut option was selected in Media Handling menu and printer has detected a fault. 1. Cutter option is not installed or is disconnected while the Cut option is selected in Media Handling. 2. Cable from cutter assembly to cutter PCBA is not connected. 3. Cable from cutter PCBA to Controller PCBA is not connected.	1. Install cutter option or select the correct Media Handling option in the configuration menu. 2. Connect cutter assembly cable. 3. Connect cutter PCBA to Controller PCBA cable.
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.

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Table 13. LCD Message Troubleshooting (continued)

Displayed Message	Can User Correct?	Explanation	Solution
xxx P/H Control Mode	Yes	Sensed Printhead temperature is 55° to 59°C causes a 50% reduction in print speed. This mode dramatically extends the time before a PRINT HEAD HOT fault would occur and permits long print jobs to complete without interruption. Printing stays in this mode until head temperature drops below 52°C where full speed printing resumes, or until head temperature reaches 60°C where printing stops with a PRINT HEAD HOT fault message displayed.	This is a printer protection feature, but the time before the printer reaches the P/H Control Mode may be extended by: 1. Placing the printer in a cooler temperature environment. 2. Cleaning the printhead more frequently between jobs. 3. Reducing the Print Speed. 4. Reducing the print intensity. 5. Extending the idle time between print jobs. 6. Reducing the amount of black image density per print job. 7. If problem persists, contact your authorized service repersentative.
POWER SUPPLY VOLT*	No	Power supply failed.	Contact your authorized service representative. Check 5A 250V fuse on power supply. Replace if necessary. Replace the power supply assembly.

NOTE: Do not press the FEED key with the "LABEL PRESENT Remove Label" message displayed or the message will be removed, until the PAUSE key is pressed. Also, each pressing of the FEED key will cause a blank label to be added at the end of the print job.

PRINT HEAD HOT See Manual	Yes	The printhead has become overheated.	1. Allow the printhead to cool down for 5 minutes, then press CLEAR. Resume printing. 2. If problem persists, contact your authorized service representative.
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).	1. Remove the ribbon from the printer if Direct Thermal media is being used. 2. Change the Print Mode from Direct to Transfer if thermal transfer printing is being used.

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Table 13. LCD Message Troubleshooting (continued)

Displayed Message	Can User Correct?	Explanation	Solution
RIBBON FAULT Check Ribbon	Yes	Ribbon not detected by ribbon sensor. 1. Ribbon is not installed or has run out. 2. A break in the ribbon has occurred. 3. Ribbon is not routed or installed in the ribbon path correctly.	1. Install new ribbon. 2. Re-attach the ribbon to the Ribbon Take-Up Spindle. 3. Check the ribbon installation procedures on page 38.
SOFTWARE ERROR* Recycle Power	Yes	1. Application software tried to perform an illegal printer function. 2. There are damaged logic circuits on the Controller PCBA.	1. Recycle printer power. If possible, print a job that has previously worked. 2. If problem persists, contact your authorized service representative.

A Specifications

Printing

Type:	Direct thermal or thermal transfer
Resolution:	203 dots per inch (8.0 dots/mm)
Print Speed:	2 to 6 ips (inches per second)
Bar Code Modulus:	10 mil to 127 mil "X" dimension in picket or ladder orientation.
Maximum Print Width:	4.09 inches (103.9 mm)
Maximum Print Length:	47 inches using maximum 4.09 inch print width. Reducing the print width extends the maximum print length up to 99 inches.
Minimum Print Length:	.500 inches
White Space Slew Rate:	2 to 6 inches per second
Minimum Dot Size:	.0033 inches (0.083 mm) square
Label Backfeed:	For label dispensing modes and optional media cutter
Fonts:	
Resident Fonts:	Courier Bold, Triumvirate Bold Condensed, and Letter Gothic scaleable outline fonts and bit-mapped OCR-A, OCR-B.
Optional Fonts:	A wide selection of scaleable outline proportional and monospace fonts is available.
Font Expansion:	All fonts expandable vertically and horizontally.
Bar Codes:	Code 39, Interleaved 2 of 5, Code 128 (subsets A, B, and C), Codabar, UPC-A, UPC-E, UPC 2- & 5-digit addendums, EAN-8, EAN-13, EAN 2- & 5-digit addendums, Code 93, MSI Plessey, UPCSHIP (IGP/VGL only), UCC 128, Postnet, PDF 417 (IGP/PGL only), FIM.

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Media:

Type: Roll-fed, die-cut continuous or fan-fold labels, tags or tickets; most direct thermal or thermal transfer materials.

Supply Roll: 8 in. (203 mm) maximum diameter on 3" (76 mm) diameter cores.
7 in. (178 mm) maximum diameter on 1" (25 mm) diameter cores.

Internal Rewinder: Accepts a 5 inch diameter roll of labels or label backing.

Label Material: Thermal transfer plain-coated papers, vinyl, Mylar®, metallized paper, non-woven fabric, fine woven fabric, thermal-visible light scannable paper, infrared scannable paper, thermal ticket/ tag stock, thermally sensitive plastic stock.

Thermal Transfer Ribbons: Standard Widths are:
1.00" (25mm)
1.57" (40mm)
2.36" (60mm)
3.15" (80mm)
4.33" (110mm)

Media Sensing: Moveable "see-through" for die-cut labels and reflective for tags with black striping.
The T4204 printer uses a movable sensor to detect index holes/notches or the black stripe in tag stock. The Transmissive sensor position is indicated by the sensor crystal at the front of the label guide that is visible with the printhead open. The Reflective sensor position is located under the R2, far right side resistor, also visible with the printhead open. The sensor can be moved by squeezing the two locking tabs, located under the label guide, and sliding the sensor assembly in or out. For proper sensing, ensure that the sensor is aligned with the center portion of the index hole/notch or black stripe.

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.

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Label/Tag Media Specifications

Front of Printer

Direction of Media Motion
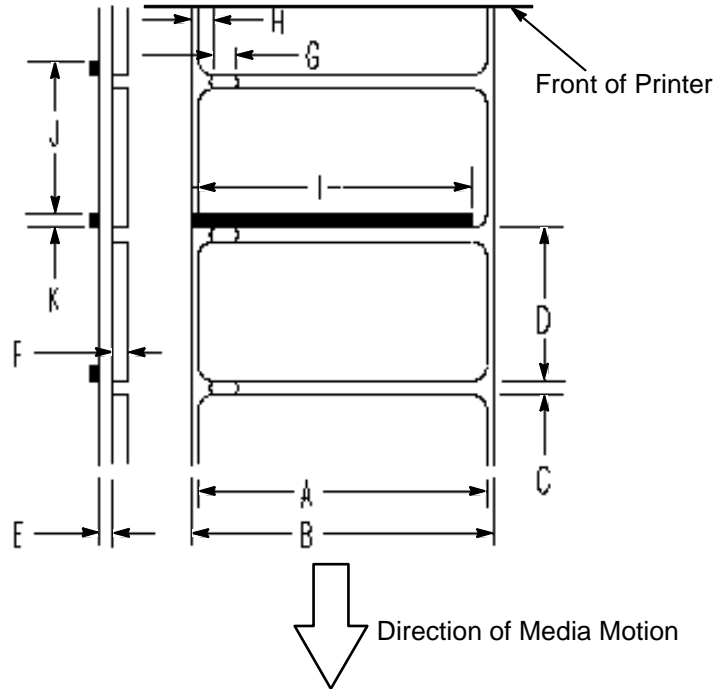
	Description	T4204	
		Max (in.)	Min (in.)
A	Label width	4.50	1.12
B	Backing width	4.50	1.12
C	Gap between labels or length of sensor opening	0.512	0.118
D	Label Length	47.0	0.500[1]
E+F	Media thickness	0.010[2]	.0025
G	Width of sensor opening	None	0.236
H	Edge of media to edge of sensor opening distance	1.654	0.250
I	Reflective sensor mark width	4.00	1.000
J	Distance between reflective mark trailing edge to trailing edge	47.0	0.500
K	Reflective sensor mark length	47.0	0.118
1. 0.750 inches using Peel-Off Media Handling. 2. 0.006 inches using the Media Cutter option (Cut Media Handling).			

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Lists Of Approved Media

For a current list of approved standard media for use in Printronix thermal and thermal transfer label printers, please call Printronix at (800) 733-1900 or FAX (714) 368-2354. Further information can be obtained by calling the Printronix Thermaline Help Desk at (714) 368-2488 or from the Printronix Web Page at http://www.printronix.com.

Indicators And Switches

Indicator Lights:	ONLINE
Switches:	POWER
Keys:	PAUSE, FEED, CANCEL, TEST, CLEAR, PRT CONFIG, JOB SELECT, ENTER, UP, DOWN, PREV, NEXT
Message Display:	2-row 16-characters per row for error messages, print status, and recalling stored formats

Host Interfacing

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.
3. Coax/Twinax (optional).
4. Ethernet 10 Base - T (optional)

The RS-232 and RS-422 host interfaces shall have the following characteristics:

Character Set:	ANSI® ASCII character set
Word Length:	Selectable 7-bit or 8-bit data format
Handshaking:	XON/XOFF (in receive mode only) and RTS/DTR
Input Buffer:	Selectable from 1k through 16 kbytes.

Electrical:

Power Source:	115 or 230 VAC 50/60Hz switching power supply.
Circuit Protection	One T6.3-amp, 250V Time-Lag fuse.
Grounding:	Unit must be connected to a properly grounded receptacle.

Memory:

Flash Memory (standard)	2MB soldered on Controller PCBA and 2MB 80-pin SIMM at location U38 on Controller PCBA
DRAM (standard)	4MB 72-pin SIMM at location U33 on Controller PCBA

Environmental:

Operating:	40° F to 104° F (4° C to 40° C)
Storage Temperature:	-40° F to 150° F (-40° C to 60° C)
Humidity:	20% to 85%, non-condensing
Ventilation:	Free air movement
Dust:	Non-conducting, non-corrosive

Physical:

Dimensions:	12.2" H x 9.5" W x 17.0" D
Weight:	31 pounds

Options:

Media Cutter:	Automatically cuts printed media with maximum thickness of 0.006 inches (0.153 mm). Certain types of media are excluded. The cutter should not be used to cut through the adhesive portion of a label.
Label/Tag Catcher Tray:	Used with the Media Cutter option to catch the cut media and collect it away from the Media Cutter Assembly.
Coax/Twinax Interface:	Provides protocol converter functionality and connectivity for IBM coax/twinax host interfaces
PrintNet Server	Available in Ethernet 10Base-T configuration. (Optionally in 10Base2) configuration. Allows placing the T4204 on a LAN rather than attaching it directly to a host system.

B *Printer Options*

A comprehensive series of options is 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

Media Cutter

The printer may be ordered with a cutter mechanism installed (for cutting tags and labels), or the option can be installed by an authorized service representative at a later date. When properly installed, the printer can be configured to automatically cut media after each label is printed or via the software command to cut media after a specified number of labels is printed.

Label And Tag Catcher Tray

This option is used exclusively with the media cutter option to slide cut labels or tag stock away from the media cutter and collects them a safe distance away. This option is field installable by the operator.

Interface Options

Coax/Twinax Host Interface

The coax/twinax host interface option functions as a protocol converter to allow the direct connection of the printer to an IBM host computer that uses either a coax or a twinax data interface. This option should be installed only by an authorized service representative.

PrintNet 10Base2 (BNC) (Externally Mounted)

Permits placing the printer on a LAN rather than attaching it directly to a host system. It connects externally to the T4204 Centronics parallel port. Only Ethernet is supported. This option is field-installable by the operator.

PrintNet 10Base-T (UTP) (Externally Mounted)

Permits placing the printer on a LAN rather than attaching it directly to a host system. It connects externally to the T4204 Centronics parallel port. Only Ethernet is supported. This option is field-installable by the operator.

PrintNet 10Base-T (UTP) (Internally Mounted)

Permits placing the printer on a LAN rather than attaching it directly to a host system. It is mounted inside the printer. Available as a factory option only. Not supported if the Coax/Twinax option is installed.

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Supplies And Accessories

The best printing solution is achieved when the printer, ribbon, and media are matched to the application requirements. The use of Genuine Printronix Thermal Media and Ribbons will ensure optimum image quality, consistent bar code performance, and extended life of the printhead.

Please refer to the Printronix Media Selection Guide for details concerning the application suitability for all Media and Ribbon products. To obtain a copy of this Guide, or for any other questions concerning Genuine Printronix Thermal Supplies, please call:

Americas:	(800) 733-1900	Fax: (714) 368-2354
Europe, Middle East, Africa:	(33) 1-46-25-1900	Fax: (33) 1-47-28-9993
Asia:	(65) 548-4116	Fax: (65) 546-1588

Or visit our website at **www.printronix.com**.

Genuine Printronix Thermal Transfer Ribbons

The following is a list of Genuine Printronix Thermal Transfer ribbons:

Printronix Economy Wax Ribbon 5200

Excellent image quality, especially on coated thermal transfer papers.

Printronix Prime Wax Ribbon 5400

Excellent high speed print quality with premium durability performance on a wide range of thermal transfer receptive papers and films.

Printronix Premium Resin Ribbon 5600

Excellent image scuff resistance while achieving premium print quality on a wide range of synthetic films and coated papers.

Printronix Harsh Environment Resin Ribbon 5700

Highest heat, chemical, and abrasion resistance for use with high-end synthetic facestocks. Meets UL/CSA regulatory requirements when used with the proper Polyester media.

All ribbons are available in widths of: 1.00 inch (25mm), 1.57 inches(40mm), 2.36 inches (60mm), 3.15 inches (80mm), and 4.33 inches (110mm).

Genuine Printronix Media

Printronix provides a wide variety of sizes, colors, and shapes of labels and tags readily available to meet all of your labelling needs. The Printronix Expanded Die Library details hundreds of label sizes and configurations which are quickly obtainable through the Printronix custom order system without the typical added costs and delays associated with the creation and tooling of a special die to match your requirements.

Genuine Printronix ThermaLine Media		
ThermaLine Media Type	**Base Material**	**Application**
Media 110	Premium Paper Label	Thermal Transfer
Media 120R	Premium Paper Label, Removable Adhesive	Thermal Transfer
Media 180T	Premium Thermal Transfer Tag	Thermal Transfer
Media 210	Premium Paper Label	Direct Thermal
Media 220	High Sensitivity, Premium Label	Direct Thermal
Media 270IR	Infra-Red Scannable, Premium Paper Label	Direct Thermal
Media 280T	Premium Paper Tag (card stock)	Direct Thermal
Media 410	Premium Polyolefin Label	Direct Thermal
Media 510	Semi-Gloss Polyolefin Label	Thermal Transfer
Media 520	"Smudge-Proof" Polyolefin Label	Thermal Transfer
Media 710	White Polyester (2 mil) Label	Thermal Transfer
Media 730	Matte Chrome Polyester (2 mil) Label	Thermal Transfer
Media 750	Bright Chrome Polyester (2 mil) Label	Thermal Transfer

Besides the standard roll label configuration, Genuine Printronix ThermaLine labels are also available in fanfold configurations.

Type	Media (Stock)	Ribbon	Features	Typical Applications
Direct Thermal	Paper Label Tag Synthetic Label	Not Used	Low cost. Ease of use. Low environmental durability. Limited label life. Will fade and/or discolor when exposed to heat, sunlight, or chemicals.	Shipping. Inventory Tracking.
Thermal Transfer	Paper Label Tag	Printronix Economy Wax	Lowest cost thermal transfer combination. Most commonly used. Low environmental durability. Low abrasion resistance. Longer life than direct thermal.	Shipping. Inventory Tracking. Product Labelling. Compliance Labeling.
Thermal Transfer	Paper Label Tag Synthetic Label Tyvek® and Valeron®	Printronix Prime Wax	Mid-range wax resin performance and characteristics at economy wax prices. Darker, razor-sharp, smudge-proof images.	Same as economy applications with advantage of supporting Polypropylene, Polyethylene, Polyolefin, and Valeron media.
Thermal Transfer	Paper Label Tag Synthetic Label	Printronix Premium Resin	Better environmental durability. Better abrasion resistance than wax. More expensive than wax. Good aesthetic appearance.	Retail applications where labels are handled. Excellent for most applications. Compliance Labelling.
Thermal Transfer	Synthetic Label	Printronix Harsh Environment Resin	High environmental durability. High physical durability. Excellent aesthetic appearance. Most expensive label/tag combination.	High temperature environments. Medical applications. Outdoor environments. Environments with chemicals. Compliance labelling.

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Accessories

Field installable accessories available for the T4204 printer are listed below. Always refer to the Printronix part number when placing an order.

Description	Part Number
Media Cutter, T4204	750884-901
Label and Tag Catcher Tray (used with a Media Cutter option)	750904-001
Coax/Twinax Host Interface option	750851-001
PrintNet 10Base2, option	750886-001
PrintNet 10Base-T, option	750885-001
User's Manual	750514-001
Quick Reference Manual	171278-001
Maintenance Manual	750513-001
LP+ Programmer's Reference Manual	750515-001
IGP/PGL Programmer's Reference Manual	750516-001
IGP/VGL Programmer's Reference Manual	750557-001
PrintNet User's Manual	750517-001
C/T Programmer's Reference Manual	164300-001
Printronix Printer Manager User's Manual	164129-001

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C *Setting The Page Length*

Observe the following considerations when you set the Page Length value (the length of the leading edge to the trailing edge of the label) in the Printer Control menu, or set the Host Forms Length via host software:

- When using continuous media (no gaps, notches, holes, or black marks), the physical page length will be based on the Page Length value in the Printer Control menu or the Host Form Length value sent via host software. The user selected page length will dictate what the physical length will be.

- When using non-continuous media (with gaps, notches, holes, or black marks) the Physical Page Length is established by the distance between the trailing edge of the gap, notch, hole, or black mark.

- Logical Page Length, also refered to as the printer control page length or the Host Form Length, is usually the same measurable length as the Physical Page 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 page, or having a blank space on the remaining portion of the physical page.

- In the default case any form or page length sent from an emulation (the ^L or ^H command in VGL and the length defined within the ~CREATE statement in PGL) will be used to force the page length.

- The media sensors (Transmissive or Reflective) are used to detect the Top-of-Form position, based on the trailing edge of the gap, notch, hole, or black mark. If the page length you have selected (either from the secondary control panel or through the host) does not match the physical page length, then the printer will attempt to map the logical page onto the physical page.

If the logical page length is less than the physical page length, the printer will leave white space at the end of the label so that the next logical page will start at the beginning of the next physical page. If the user-selected (logical) page length is greater than the physical page length, the printer will clip the page to fit onto the physical page when the Clip Page option is enabled under the Printer 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 page, after a paper advance.

The following recommendations indicate how best to set up the printer and use the media sensor.

- If the application sends the logical page length to the printer, then there is probably nothing to change in the setup other than to enable the proper media sensor. The printer and the application will use the Host Form Length for the logical page length. As long as the physical page length is really the same as the logical page length (which it should be), the printer will operate normally.

- If the application sends the logical page length to the printer but it is inaccurate (e.g., you wish to fit two logical pages onto one physical page), then you must make sure that Host Form Length is set to Disabled and must also set the Page Length under the Printer Control menu in the secondary control panel to the physical page length.

- If the application does *not* send the page length to the printer, then you must select the page length from the secondary control panel. This value must be accurate, both in terms of what the application expects and the physical page length. If it does not match the physical page length, then there will be clipping or extra white space.

- The Page Length range is limited to 47.0 inches (1193.8mm) when the Page Width value is set to 4.1 inches. Decreasing (narrowing) the Page Width value will extend the limits of the Page Length range that you can select—up to a maximum of 99.0 inches.

D   *ASCII Control Codes*

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
NUL	0	00		32	20	@	64	40	'	96	60
SOH	1	01	!	33	21	A	65	41	a	97	61
STX	2	02	+	34	22	B	66	42	b	98	62
EXT	3	03	#	35	23	C	67	43	c	99	63
EOT	4	04	$	36	24	D	68	44	d	100	64
ENQ	5	05	%	37	25	E	69	45	e	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	H	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	K	75	4B	k	107	6B
FF	12	0C	,	44	2C	L	76	4C	l	108	6C
CR	13	0D	-	45	2D	M	77	4D	m	109	6D
SO	14	0E	.	46	2E	N	78	4E	n	110	6E
SI	15	0F	/	47	2F	O	79	4F	o	111	6F
DLE	16	10	0	48	30	P	80	50	p	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	T	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	X	88	58	x	120	78
EM	25	19	9	57	39	Y	89	59	y	121	79
SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
ESC	27	1B	;	59	3B	[	91	5B	{	123	7B
FS	28	1C	<	60	3C	\	92	5C			124	7C

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Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
GS	29	1D	=	61	3D	]	93	5D	}	125	7D
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	ª	166	A6	_	198	C6		230	E6
ç	135	87	_	167	A7	+	199	C7	•	231	E7
ê	136	88	¿	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	CB	+	235	EB
î	140	8C	1/4	172	AC		204	CC	_	236	EC
ì	141	8D	¡	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	B3	+	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	º	248	F8
Ö	153	99	1	185	B9		217	D9	¿	249	F9
Ü	154	9A		186	BA		218	DA	I	250	FA
°	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)
XOFF = Ctrl S (DC3)

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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 mark to establish a predetermined label or tag length. With this media type, the Host Form Length or user selected Page 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.

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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. The T4204 can print at 2, 3, 4, 5 and 6 IPS.
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 mark 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 Cutter An optional device attached to the front of the printer that cuts the media after it is printed into individual labels or after a specified number of labels.

Media Sensor The assembly 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 mark 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.

PCBA Printed Circuit Board Assembly. A PCB with components (ICs, resistors, capacitors, etc.) installed.

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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 inch or 3 inch cardboard core. The T4204 media support assembly accepts both core sizes.
Slew	Rapid 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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