

# QLS™ 2000/3000 Series

## Digital Color Printers Operation & Setup Guide

Part No. 22834-451

03/05

Firmware V 1.3

Specifications are subject to change without notice.

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Repair parts and replacement parts will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts become the property of QuickLabel Systems. Travel, freight, and other expenses related to warranty repairs are not covered. Service Agreements are available for purchase and provide on-site service and/or loaner equipment. This warranty is void if the product has been damaged by accident, abuse, neglect or misapplication, or if the product has been improperly installed, or if the product has been modified without the express written permission of QuickLabel Systems.

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#### Canadian Emissions Requirements

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

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

#### FCC Compliance Statement

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. Shielded cables must be used with this unit to ensure compliance with the Class A FCC limits.

**WARNING**

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

**NOTE**

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 provide 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 operation guide, 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.

**Ownership Information**

Use the spaces below to record the model and serial number of your product.

Model \_\_\_\_\_ Serial No. \_\_\_\_\_

**Contact QuickLabel Systems**

Contact QuickLabel Systems to pass along your comments about any QLS product, Astro-Med, Inc. Data Acquisition Instrument, Grass Instruments, or related software products. To contact the QuickLabel® Systems Development Group, call 401-828-4000 or e-mail us at [qls@astromed.com](mailto:qls@astromed.com).

## DECLARATION OF CONFORMITY

**Manufacturer's Name:** Astro-Med, Inc.  
**Manufacturer's Address:** Astro-Med, Inc.  
600 East Greenwich Avenue  
West Warwick, RI 02893 USA

declares that the product

<b>Product Name:</b>	QLS-2000	QLS-2001
	QLS-3000	QLS-3001

conforms to the following product specifications:

Safety:	EN 60950-1:2001 CAN/CSA C22.2 No. 60950-1-03
EMC:	EN 55022:2000, Class A EN 55024:1998 EN 61000-3-2:2000 EN 61000-3-3:1995

Relevant Directives are 89/336/EEC and 73/23/EEC

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03/03/2005

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# Chapter 1

## Before You Get Started

### Overview

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All QLS 2000/3000 series thermal transfer printers print in vibrant spot color. In addition, the 3000 model prints full process color.

QLS 2000 Model ..... Prints two spot colors on one side of the media.

QLS 2001 Model ..... Prints one spot color on each side of the media simultaneously.

QLS 3000 Model ..... Prints three spot colors or full process color on one side of the media.

QLS 3001 Model ..... Prints two colors on one side of the media and one color on the opposite side simultaneously.

### 2000/3000 Digital Color Printer Specifications

Print Method ..... thermal transfer

Print Speed ..... up to 5 ips

Resolution ..... 304 dpi

RAM ..... 1 MB Flash optional for download and storage of bitmaps or fonts. Dynamic sizing of RAM occurs automatically when maximum label length is changed to accommodate download of bitmaps or fonts.

Drivers ..... Windows or Macintosh

Communications ..... RS232, RS422, Centronics® Parallel

Pin table for the serial interface is:

- 1 .....not used
- 2 .....TXD (transmit data)
- 3 .....RXD (receive data)
- 4 .....DTR (data terminal ready)
- 5 .....ground
- 6 .....DSR (data set ready)
- 7 .....internally connected
- 8 .....internally connected
- 9 .....not used

Media Travel Sensors .....

- Transmissive .....Senses the gap, inverted gap, notch, string hole, or punch out. This sensor is marked by a sliding red handle and pointer that is to be positioned over the gap, notch, string hold, or punch out.
- Reflective .....Senses a black mark on the underside of a label or tag. This is a fixed sensor and is not adjustable.

TTR Media Roll Length .....300 meters

TTR Media Widths .....1.75, 2, 2.75, 3.25, 3.75 inches

Label Media .....die cut or continuous; paper, plastic, or synthetics;  
card or care tag

Min/Max Label Media Size .....1" to 4.625" W x 0.2" to 22" L

Max Label Thickness .....12 pt

Min/Max Print Width .....5 mm to 4.4 inches



Label Print Software .....	optional
Label Design Software.....	optional
Standard Bar Codes .....	all standard, plus Agfa® True Type™ scalable fonts
Power Requirements .....	110/240V A/C, 50/60 Hz, 400W
Dimensions .....	20" x 17" x 22"
Weight .....	84 lb
Heat Intensity.....	1 (coolest, results in the lightest output) to 32 (hottest).
Other Options .....	external cutter, external cutter-stacker, external rewinder

## Comm Ports

Ports for external connection to the printer are provided on the rear of the unit.

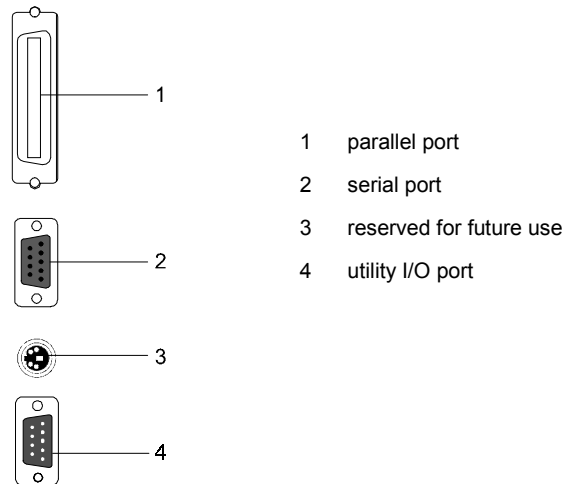
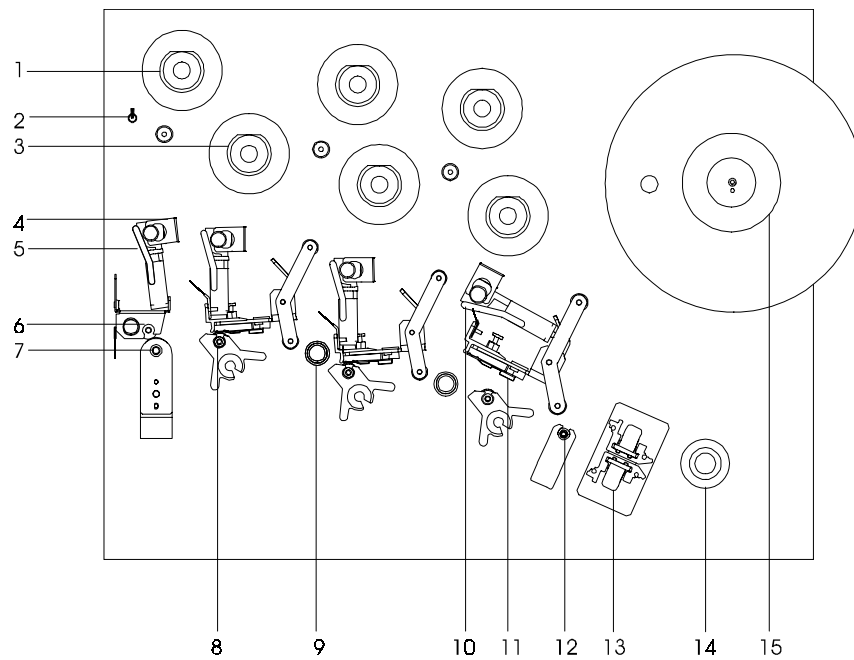


Figure 1, QLS 2000/3000 Comm Ports

## Internal Components

All models contain mechanisms similar to those shown on the 3000 model illustrated.



**Figure 2, Interior - QLS 3000 Digital Color Printer**

- 1 thermal transfer ribbon (TTR) rewind mandrel (front print station)
- 2 TTR tension switch
- 3 TTR unwind mandrel (front print station)
- 4 silver clip holding the cam
- 5 drive roller pressure cam lever (closed position)
- 6 drive roller pressure support assembly

- 7 drive roller
- 8 platen roller
- 9 guide roller
- 10 print station cam lever (open position)
- 11 printhead
- 12 media index roller
- 13 media sensor (reflective/gap-notch sensor inside)
- 14 media guide roller
- 15 media unwind mandrel

## User Interface

### Keypad & Indicator Lights

When power is on, indicator lights provide a visual indication of the printer's current status. The buttons on the front panel provide access to menus:

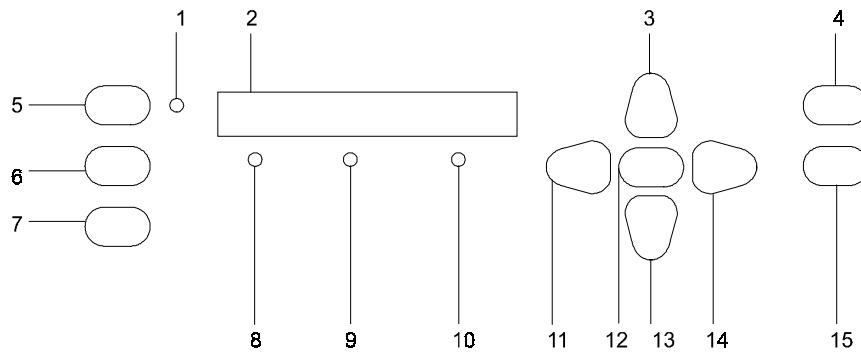


Figure 3, QLS 2000/3000 Keypad & Indicator Lights

- 1 **Print/Pause LED**  
Illuminates when pressed, when the printer is paused, when an error occurs, and when TTR or label media runs out.
- 2 **LCD Display**
- 3 **Up Arrow**  
Cycles through settings within a menu; cycles through submenus.
- 4 **Menu**  
Displays current status, protocol, media type, printing progress, and speed. Press to toggle from current status to a selection of submenus.
- 5 **Print/Pause**  
Toggles the printer from print to halt printing.
- 6 **Form Feed/Advance**  
Advances the media by one full label length (to the next registration mark) when pressed and released; continually advances the media when pressed and held.
- 7 **Calibrate**  
Calibrates the appropriate top-of-form sensor to the currently loaded media.
- 8 **Data LED**  
Blinks when data is received from an external source.
- 9 **Error LED**  
Illuminates when an error condition occurs.
- 10 **Power LED**  
Illuminates when the printer is in a Ready state.
- 11 **Left Arrow**  
Cycles the display through menu choices displays current settings for active menus. To navigate submenus and select menu options, use the arrow buttons.
- 12 **Select**  
Accepts the displayed setting.
- 13 **Down Arrow**  
Cycles through settings within a menu; cycles through submenus.
- 14 **Right Arrow**  
Cycles the display through menu choices, displays current settings for active menus. To navigate submenus and select menu options, use the arrow buttons.
- 15 **Cancel**  
Cancels the current label(s) or test pattern.

## **Chapter 2 Printer Setup**

### **Assembly**

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#### **QLS 2000/3000 Series Printers**

Printers are shipped partially disassembled to prevent damage during shipment. Locate the printer cover and five #6 screws shipped with the equipment.

Attach the cover to the printer.

#### **Cutter, Cutter-Stacker, or External Rewinder**

Peripherals are documented separately. Refer to the documentation for the appropriate option. The connection from the cutter or cutter-stacker to the printer will be through the printer's utility I/O port.

### **Communications**

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#### **Printer Drivers**

Refer to the printer driver documentation for software installation instructions. QLS 2000/3000 series printers can be addressed by a Windows™ driver, by QuickLabel Systems CQL 99™ software, and by third-party software.

#### **Platforms Supported**

IBM-compatible PCs and Macintosh workstations are supported.

QLS 2000 and 3000 Series printers can receive data through either a serial or parallel connection. Bidirectional communication (send and receive) is supported serially.

**TO CONNECT THE PRINTER TO A WORKSTATION:**

1. Be sure power is Off.
2. Connect (parallel or serial) communications cables and power cables between the rear of the printer and power and comm sources.

## Comm Protocol

Protocol can be set by the printer driver, by CQL 99, or by third-party software.

**TO SET THE COMMUNICATIONS PROTOCOL AND SELECT A HOST COMMAND PREFIX:**

1. Press the Menu button to display the main menu.
2. Use the arrow keys to move the on-display indicator to Comm, then press Select. The Communications menu will be displayed.
3. With the on-display indicator positioned at Ptel press Select.
4. Use the arrow keys to select the printer name (required for use with CQL 99 label creation software) or to select Graphics (for other Windows applications).
5. You will be prompted to confirm. To confirm and save the new parameters, move the cursor before Yes, then press Select.
6. Use the arrow keys to position the on-display indicator before Pref and press Select.
7. Use the arrow keys to select a command prefix and a format prefix for host protocol commands to be received by the printer. Defaults are <SOH> for the command prefix and <STX> for the format prefix. If you are using CQL 99 label creation software, use the default command prefixes.

8. You will be prompted to confirm that you want to permanently change the communications parameters. To save communications parameters, move the cursor before Yes, then press Select.
9. With the on-display indicator positioned before Delim press Select.
10. Use the arrow keys to select a command delimiter for commands to be received by the printer. The default delimiter is <CR><LF>. If you are using CQL 99 label creation software, use the default command delimiter.
11. You will be prompted to confirm. To confirm and save communications parameters, move the cursor before Yes, then press Select.

## Comm Port

The comm port in use (parallel, RS-232, or RS-422) must be selected to enable communications. If either RS-232 or RS-422 are being used, baud rate can also be selected. The default comm port is parallel.

**NOTE SERIAL COMMUNICATIONS ARE REQUIRED TO ENABLE STATUS MESSAGES TO BE RECEIVED FROM THE PRINTER OR TO ENABLE USE OF CQL™ 99 LABEL CREATION SOFTWARE (BIDIRECTIONAL COMMUNICATIONS).**

If using both parallel and RS-232 serial communications, select and set up RS-232 first, then select and set up parallel communications.

### **TO SELECT COMM PORTS:**

1. Press the Menu button to display the main menu.
2. Use the arrow keys to move the on-display indicator to Comm, then press Select. The Communications menu will be displayed.
3. With the on-display indicator positioned before Port, press Select.
4. Use the arrow keys to specify which port is being used and press Select to confirm.

## Baud Rate / Handshaking

If the Comm Port setting is RS-232 or RS-422, set Baud Rate and Handshaking to match host workstation settings. The default baud rate is 19,200.

**TO SET BAUD RATE AND HANDSHAKING METHOD:**

1. Press the Menu button to display the main menu.
2. Use the arrow keys to move the on-display indicator to Comm, then press Select. The Communications menu will be displayed.
3. Press the right arrow to move to the Baud Rate field. The default rate is 19,200. To change the default, press the up/down arrow to select a new rate, then press Select.
4. You will be prompted to confirm the change. Press the up/down arrow to indicate Yes, then press Select.
5. Press the right arrow to move to the Hshk field, then press Select.
6. Press the up/down arrow to select XON/XOFF or Hardware, then press Select.
7. You will be prompted to confirm that you want to permanently change the communications parameters. To save communications parameters, move the cursor before Yes, then press Select.



## Media

### Loading Thermal Transfer Ribbon (TTR) Media

If your printer is a QLS 3000 model and you are setting up for process color printing, load ribbon in the following sequence:

- Front Printhead ..... Cyan TTR
- Center Printhead ..... Magenta TTR
- Rear Printhead ..... Yellow TTR

If you are setting up for spot color printing on any model, ribbon can be loaded in any sequence.

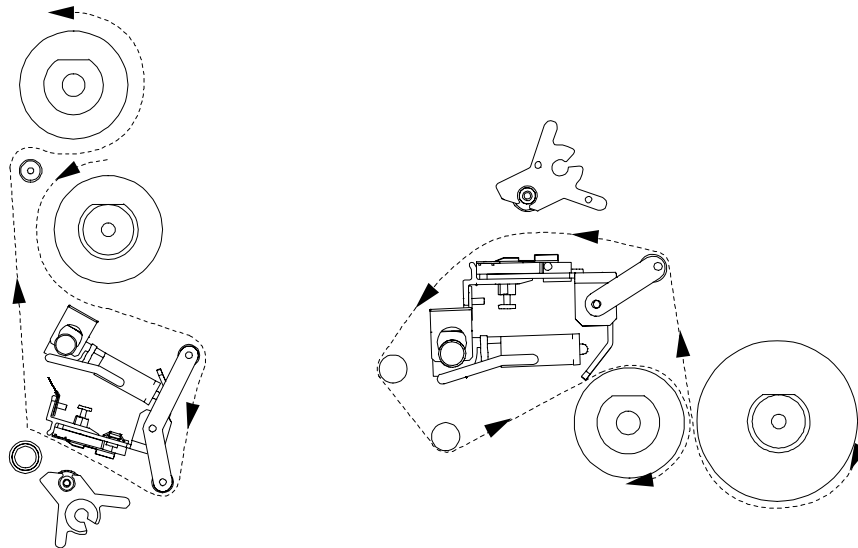


Figure 4, TTR Media Path on Standard Printstation, or on Inverted Printstation

**TO LOAD TTR:**

1. Be sure power is Off. Raise the printer cover.
2. Fully seat TTR roll on the TTR unwind mandrel. Ensure that the ribbon unwinds to the left of and beneath the roll.
3. Fully seat a cardboard take-up core on the associated TTR rewind mandrel.
4. Open the printhead (flip printhead cam lever counterclockwise on standard printstations, clockwise on inverted printstations).
5. Advance the TTR around the outside of each station's TTR guide roller(s).
6. Advance the TTR between the printhead and the platen roller.
7. On standard printstations, advance the TTR over the TTR guide spindle. On inverted printstations, advance the TTR around the outside of the station's two guide spindles.
8. On standard printstations, advance the TTR beneath and around the cardboard take-up core on the rewind mandrel. On inverted printstations, advance the TTR above and around the take-up core.
9. Tape the TTR to the core.
10. Close the printhead.
11. Repeat procedure for remaining printstations.

Adjustment of the ribbon tension may be required after loading TTR. If the TTR is wrinkling or smudging, adjust the tension to alleviate these conditions.

## Loading Label Media

The Media menu allows you to tell the printer what type of media is loaded on the printer: sensors, image dimensions, label dimensions, and any offsets.

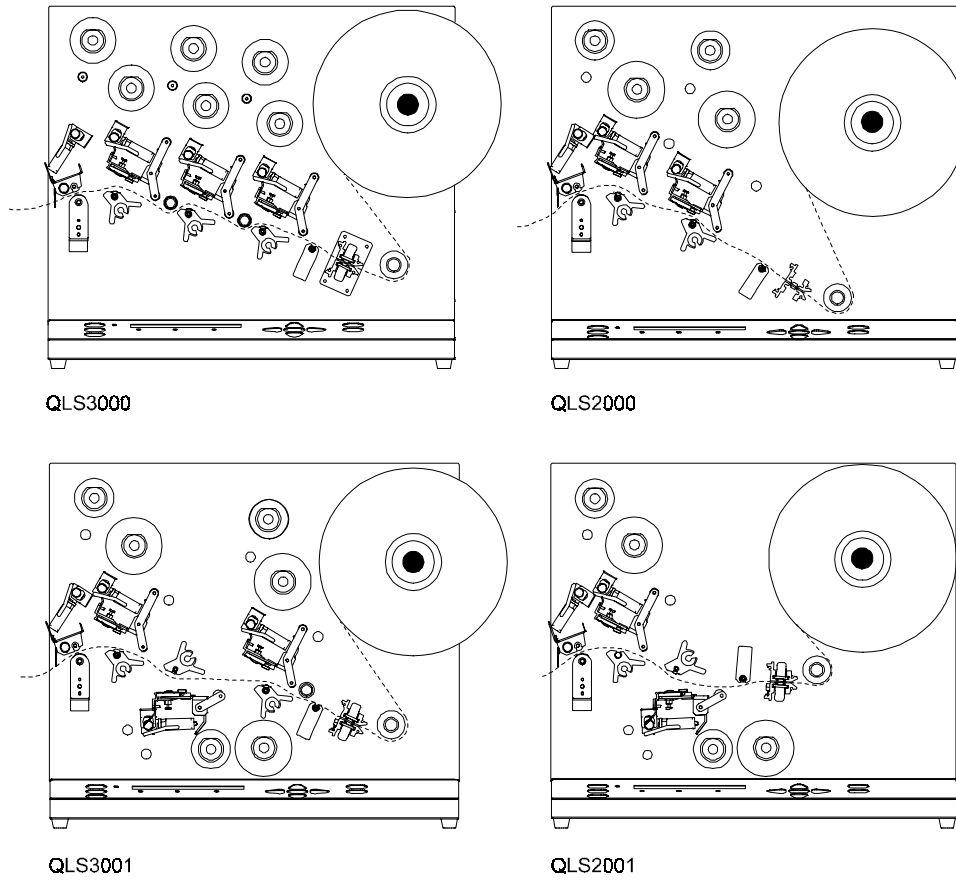
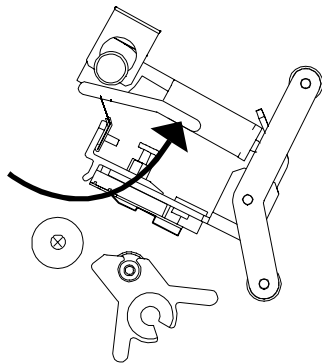


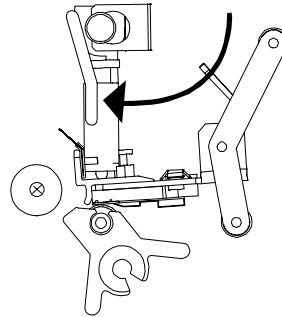
Figure 5, Label Media Path, 2000/3000 Series Printers

**TO LOAD LABELS:**

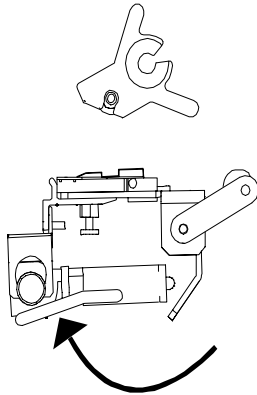
1. Be sure power is Off. Raise the printer cover.
2. To open each printhead, flip the cam lever on each (counterclockwise on standard printheads, clockwise on inverted printheads).



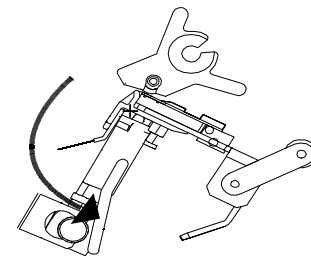
**Figure 6, Standard Printhead Open**



**Figure 7, Standard Printhead Closed**

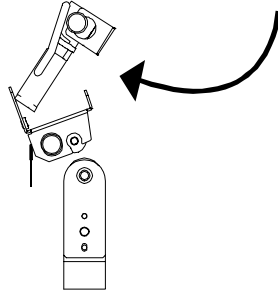


**Figure 8, Inverted Printhead Open**

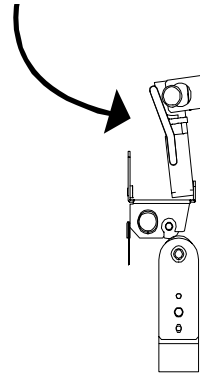


**Figure 9, Inverted Printhead Closed**

3. Open the drive roller by flipping the drive roller pressure cam lever open.



**Figure 10, Drive Roll Cam Open**



**Figure 11, Drive Roll Cam Closed**

4. Remove the media retainer from the media unwind mandrel.
5. Install a roll of media on the mandrel. Ensure that the roll is fully seated on the mandrel and reinstall the retainer to secure it.
6. Thread the media around the media guide roller and through the media travel sensor housing.
7. On QLS 2001 models, thread media under the media index roller. On all other models thread media over the media index roller.
8. On models with standard print stations, thread the media over the platen rollers and under the guide rollers (if present). On models with inverted print stations, thread the media beneath the platen roller.
9. After threading the media over the platen roller on the last print station, thread the media over the drive roller and out of the printer.
10. Slide the media against the plastic guide block on the vertical plate. Be sure not to buckle the carrier against this block.
11. Close the printheads and the drive roller.

## Specify Media Type

1. Press the Menu pushbutton to display the Main menu.
2. Use the arrow buttons to move the on-display indicator to the Media position, then press the Select button to display the Media menu.
3. From the Media menu, use the arrow buttons to position the on-display indicator before Type.
4. Press the Select button to move to the next line.
5. Use the arrow buttons to specify whether the stock has any top-of-form indicators, and if so, which type:

Continuous.....Top-of-form sensor detects no indicators.

Gap .....Top-of-form sensor interprets a gap, slot, or hole as a top-of-form indicator.

Inverted Gap .....Top-of-form sensor interprets a solid area as a top-of-form Indicator.

Mark .....Top-of-form sensor interprets a dark reflective mark as a top-of-form indicator.

## Calibration

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### Current Media

Calibrating the printer for the media being used is essential. Calibrate after every change of label size or type.

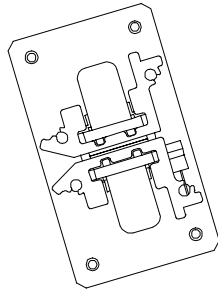
During calibration, the printer senses any top-of-form indicator between labels and allows the printer to position widely varying types of media automatically and correctly. The printer stores the last calibrated values and menu setups even after shut down and restart.

When calibrating continuous media, media length cannot be calibrated. Instead, the printer is calibrated to detect the Media Out condition.

The printer's internal label queue is reset during calibration. Any labels pending in the queue are terminated.

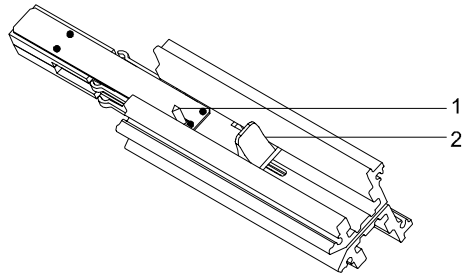
**TO CALIBRATE THE PRINTER:**

1. Press the Pause/Print button to pause the printer.
2. Press and hold the Form Feed/Advance pushbutton until the gap, notch, or index mark separating labels on the media roll is positioned within two inches of the media travel sensor housing.



**Figure 12, Media Travel Sensor**

3. Confirm that the gap, notch, string hole, or punchout is aligned with the pointer on top of the media gap sensor: If the media has a gap between labels, the pointer must be positioned within the width of the label. To adjust the pointer, slide it into alignment.



- 1 Pointer
- 2 Red slider

**Figure 13, Media Sensor Assembly**

4. Confirm that the correct type of media (gap, continuous, inverted gap, or mark) is specified.
5. Press Calibrate. Confirm that the correct type of media appears on the display. If the media type displayed is not the actual type loaded, select No and return to step 4.
6. Press the arrow keys to move the on-display indicator to Yes, then press Select. The printer will perform an automatic calibration. When calibration is complete, a message will be displayed that shows the relative reflectivity or transmissiveness between the label and top-of-form mark or gap.

## Label Length

Set label length for the longest label you will be printing to ensure memory is not wasted on label area that is not used.

Maximum gap length in millimeters can also be specified. Default is 3 mm.

### **TO SPECIFY MAXIMUM LABEL MEDIA LENGTH:**

1. Press the Menu pushbutton to display the Main menu.
2. Use the arrow buttons to move the on-display indicator to Media, then press Select. The Media menu will be displayed.
3. From the Media menu, use the arrow buttons to position the on-display indicator before Label.
4. Press the Select button to move to the next line.
5. Use the arrow keys to specify label length in millimeters.



## Chapter 3 Printing

### Printer Status

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#### Initialization

When the printer is turned on, it will power up with a test pattern loaded. Press Pause/Print to start printing the test pattern.

Before printing a new label or test pattern, press Cancel to clear the current batch (in this case, the test pattern). An error message will inform you if you fail to do so.

**CAUTION WHENEVER THE PRINTER IS NOT IN USE, LEAVE PRINTHEAD CAMS AND THE DRIVER ROLLER CAM IN THE OPEN POSITION. THIS WILL PREVENT FLAT AREAS FROM DEVELOPING ON THE PLATEN AND DRIVE ROLLERS.**

#### Current Settings

**TO VIEW STATUS INFORMATION DURING PRINTING:**

1. Press the Menu button to toggle between the Setup menu and the Operation menu. The Operation menu provides:

current printer status ..... Ready, Printing, Paused, Feeding, or Advancing  
current protocol..... QLS-3000, QLS-3001, QLS-2000, or QLS-2001  
(standard, for use with Color QuickLabel™ for  
Windows) or Graphics (for other Windows  
applications)  
current media type..... gap, inverted gap, continuous, or mark  
number of labels printed ..... XcurrentX of Xbatch totalX

**TO PRINT A REPORT OF CURRENT PRINTER SETTINGS OR OF THE LAST 500 BYTES OF DATA RECEIVED BY THE PRINTER (DATA RXD):**

1. Use the arrow buttons to select Recall from the Print menu.
2. Press the Select button. Use the arrow buttons to specify options, then press Select again.

## Operation

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### CQL 99™ and Third-Party Design Software

To print, labels must be sent to the printer from a label creation or graphics application.

CQL 99 is a label creation and printing program suite available from QuickLabel Systems for use with QLS printers.

Printing from CQL 99 or from any Windows compatible third-party application is supported by the printer if the Windows printer driver from QLS is installed. Refer to the CQL 99 documentation or the documentation for third party products for instructions. When printing from CQL 99 or from third-party software, printing begins as soon as the label is downloaded, unless the printer is paused or off.

Most functions can be set from the printer's keypad, from CQL 99 software, or from third-party software.

### Print/Pause

At any point, printing can be paused. Toggle the printer On/Off by pressing the Pause/Print button.

If the printer is paused while printing a batch, the batch must be cancelled before another label or test pattern is printed.

## Advance Media

Press the Form Feed/Advance button once and release to advance the media by one label length. Press and hold the pushbutton to continually advance the media.

If the printer has not been calibrated, the media will not advance and a menu will be displayed prompting you to perform a printer calibration.

## Print Quality

---

### Test Print Quality

The printer can print four types of test patterns:

#### **Line**

Line test patterns can be used for evaluating the alignment of the printheads; evaluating printhead intensity settings; or checking the printheads for worn areas.

#### **Text**

The text test pattern allows you to examine the quality of text printing. In particular, while printing process color on the QLS-3000, the text test pattern allows you to ensure the fine color registration required for text. If the black text appears fuzzy or with color shadows, you will want to fine tune web alignment.

#### **Flood**

The flood test pattern prints a thick bar of each color, so that you can assess color saturation. If areas of white appear in a bar, adjust heat intensity for that printhead. You may also need to adjust printhead pressure.

#### **Block**

The block test pattern is most useful to assess registration by ensuring the colors are aligned with each other.

**TO SELECT AND PRINT A LINE, TEXT, OR FLOOD TEST PATTERN:**

1. Press Menu.
2. Select the Print submenu, then select Test.
3. Select a test pattern.
4. To specify the number of test patterns that you wish to print, use the arrow buttons to move the cursor to the quantity field. Use the up or down arrow pushbutton to set a quantity. Select the Infinity symbol to continuously run the pattern. Then press the Select button.
5. Select Yes when prompted to overwrite memory with the test pattern and perform the test. This will cause anything else in memory to be erased.
6. Press Pause to print the test pattern. The printer will immediately print the number of patterns specified. If infinity was selected as a quantity, Pause the printer and press Cancel to cancel the batch and clear memory.

To evaluate whether web alignment should be adjusted, print a Block Test.

**TO PRINT A BLOCK TEST PATTERN:**

1. Press the Menu button. Use the arrow keys to select Align. Before beginning web alignment for new stock, all alignment values must be set to zero (0).
2. Select Down-Web and set all the web alignment values to 0 before performing web alignment for new stock.
3. Select Cross-Web and set all the web alignment values to 0 before performing web alignment for new stock.
4. Return to the Main Menu. Select Print. Select Test.
5. Select the Blocks pattern.

6. You will be prompted to load memory with the test pattern. This will cause anything else in memory to be erased. To align, select Yes. Select No to cancel without applying modifications.
7. Specify Quantity using the up/down arrow buttons. If Infinity is selected, the printer will continuously print until it is paused or until the print job is cancelled.
8. Press Pause to resume printing. The printer will immediately begin to print labels showing the block test pattern.
9. Press Pause again to halt the printer.

Examine alignment of the blocks within the test pattern. If registration is off on block edges or the pattern is not square, realign print stations.

On the QLS-3000, the process black block should appear black without any other color along an edge. If cyan, magenta, or yellow appears along an edge, realign that print station.



**Figure 14, Block Test Pattern**

## Heat Intensity

The degree of heat applied to the stock by the printhead determines the darkness or intensity of the print. Heat intensity is determined by the length of time power is applied to the printhead.

The appropriate heat setting will vary according to the type of stock being used. In general, lower-quality stock that requires more heat to produce a satisfactory image is less advantageous than higher-quality stock to which images are quickly and easily applied at lower temperatures.

In general, to prolong the life of the printhead, set the intensity to the lowest setting that produces a quality image. Applying more heat than necessary can also reduce image quality.

**TO SET HEAT INTENSITY:**

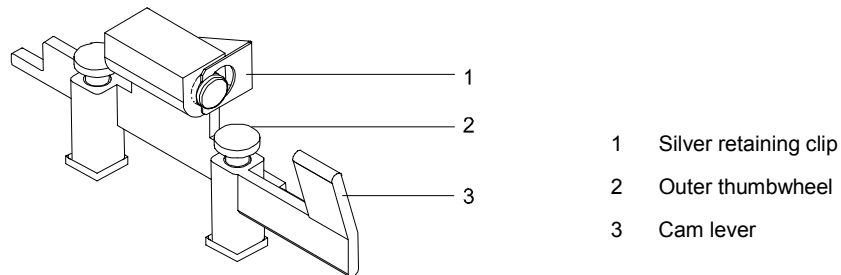
1. Press the Menu button. Use the arrow buttons to select Intensity. Press the Select button.
2. On the Intensity menu, use the arrow buttons to select a setting from 1 (coldest) to 32 (hottest) for each printhead:
3. Press the up/down arrows to increase/decrease heat intensity for each individual printhead. Different colors of film may require differing levels of heat to produce the highest quality images.

## Printhead Pressure

If switching between very wide label media and very narrow label media, it may be necessary to adjust the downward pressure on either side of the printheads.

Similarly, if switching between relatively thick media (such as card stock) and thin media, printhead pressure adjustments may be necessary.

Downward pressure on each printhead is controlled by two printhead pressure thumbwheels.



**Figure 15, Printhead Cam**

The inner thumbwheel increases or decreases pressure on the inner half of the printhead. The outer thumbwheel increases or decreases pressure on the outer half of the printhead.

Examine printed labels to determine necessary adjustments.

**TO ADJUST PRESSURE ON INDIVIDUAL PRINTHEADS:**

1. For standard printheads, flip each printhead cam lever counterclockwise to relieve pressure on and open the printheads, (flip levers clockwise on inverted printheads). Do not lock printheads into the up position.
2. To make adjustment easy, press down the silver clip holding the printhead cam and pull the cam completely out.
3. With the cam in hand, adjust printhead pressure by turning the thumbwheels as required to maximize the clarity and detail of the label. Turn thumbwheels counterclockwise to raise them, decrease pressure on the printhead, and lighten the image. Turn thumbwheels clockwise to lower them, increase pressure on the selected printhead, and darken the image.
4. Slide the cam back in place. Make sure the silver clip is securely seated.
5. Flip the printhead cam closed to restore pressure to the printhead.

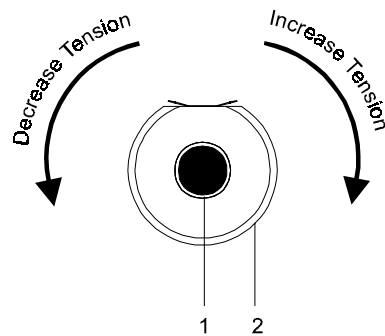
**NOTE TO PREVENT PRINTHEAD DAMAGE OR STALLING WHEN USING NARROW MEDIA, REDUCE OR ELIMINATE THE PRESSURE EXERTED BY THE PRINTER'S OUTER THUMBSCREW.**

If after adjusting printhead pressure, if print quality is not improved, check other settings that affect print quality, such as heat intensity and TTR stock type.

## TTR Media Tension

Normally, this adjustment should not be required during the life of a film roll. However, if you notice film wrinkling or one of the colors smudging, you can adjust the tension to alleviate these conditions.

If using TTR less than two inches wide, tension may be excessive when the tension switch is in the High position. If ribbons break, flip the TTR tension switch to Low. Ribbon tension can also be adjusted on each individual printstation by turning the knob on the ribbon unwind mandrel.



- 1 TTR Tension Adjust Knob
- 2 TTR Unwind Mandrel

Figure 16, TTR Unwind Mandrel

## Print Position

---

### Print and Cut Offset

Use print offset to modify print registration in fine increments or to move the entire printed image up to 1200 pixels forward or back with respect to sensor marks.

By default, when printing on media with sensor marks (gaps, reflective marks, etc.) the printer will place the label image area between the marks.



Adjusting print offset affects all print stations simultaneously. Adjust Web Alignment to modify registration at each print station individually.

**TO SPECIFY OFFSET:**

1. Press the Menu pushbutton to display the Main menu.
2. Use the arrow buttons to move the on-display indicator to Media, then press Select. The Media menu will be displayed.
3. From the Media menu, use the arrow buttons to position the on-display indicator before Offset.
4. Press the Select button to move to the next line. Use the arrow keys to set the print and cut offsets. The print offset will affect the cut offset. As a rule, the print offset should be set first:

**PRINT OFFSET:** Adjust the location of the printed image relative to the top-of-form sensor mark. Press the up arrow to move the image up the label (to the right) one pixel at a time; press the down arrow to move the image down the label (to the left).

**CUT OFFSET:** Adjust the location of the cut line in relation to the image position. Press the up arrow to move the cut line up the label, one pixel at a time; press the down arrow to move the line down the label. The cut offset is only valid when the external cutter unit is enabled.

## Web Alignment

Alignment is particularly important for process color printing on the QLS-3000.

Adjust Web Alignment to modify registration at each print station individually. Adjust Print Offset to modify the alignment of all print stations simultaneously.

To evaluate whether web alignment should be adjusted, print a Block Test.

**TO ADJUST WEB ALIGNMENT:**

1. Press the Menu pushbutton to display the Main menu.
2. Use the arrow buttons to move the on-display indicator to Media, then press Select. The Media menu will be displayed.
3. Select Align.
4. Select Down-Web to perform horizontal alignment, or select Cross-Web to perform vertical alignment.
5. Select the print station to be aligned.
6. Use the up/down arrows to change the setting for the selected print station. The arrow on the display will indicate the direction of movement.
7. Print a Test Pattern to check adjustments and continue making adjustments until the blocks in the test pattern are horizontally and vertically aligned.

## Mirror Images

When Mirror mode is used, each printed label will be printed as a mirror image, oriented in a 180° rotation from standard print orientation.

This mode is typically used for creating a clear window sticker that will be viewed from the other side of the glass (i.e., parking permit for an automobile windshield).

**TO PRINT IN MIRROR MODE:**

1. Press the Menu pushbutton until the Mode menu appears.
2. Select Mirror On or Off and press the Select button.

Mirror mode must be enabled/disabled before labels are sent to the printer. There must be no labels present in the queue to enable/disable Mirror Mode.

## Image Area

If using CQL 99 or a third-party application to create labels, the width and length of the image area are set within the application. The Image menu in this case will report these parameters as set, and will not require input.

### **TO SPECIFY WIDTH AND LENGTH OF THE IMAGE AREA:**

1. Press the Menu pushbutton to display the Main menu.
2. Use the arrow buttons to move the on-display indicator to Media, then press Select. The Media menu will be displayed.
3. From the Media menu, use the arrow buttons to position the on-display indicator before Image.
4. Press the Select button to move to the next line.
5. Use the arrow keys to specify image width and length in millimeters.

## Speed

---

The printer can print at speeds from 2 to 5 inches-per-second. When setting the motor speed, consider the requirements of the media you are using and the heat setting you are selecting. These three factors determine printer performance on each job.

### **TO SET PRINTER SPEED:**

1. Access the Print menu.
2. Use the arrow buttons to move the cursor to the Speed field, then press Select.
3. Use the arrow pushbuttons to move the cursor to the number of inches per second at which you wish to print, then press Select.

## Job Reprints

---

When printing from a Windows application, the last job sent to the printer can be reprinted.

**TO REPRINT THE LAST JOB STORED IN MEMORY:**

1. Use the arrow buttons to select Previous from the Print menu.
2. Press the Select button.
3. Press the Up/Down arrow buttons to select a quantity. If Infinity is selected, the printer will continuously print until it is paused or until the print job is cancelled.

## Chapter 4 Printer Maintenance

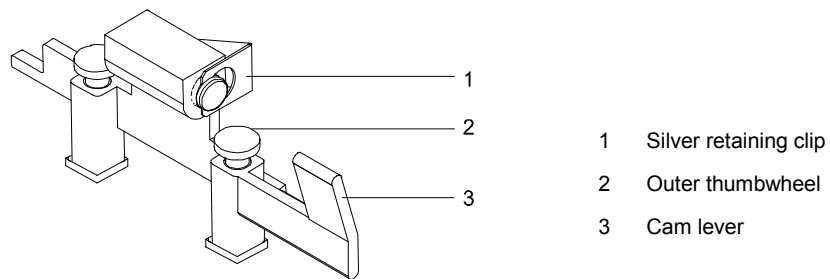
### Routine Cleaning

Printer parts accumulate residue, especially those in direct contact with the film. To maintain clear, crisp printing, clean the printer regularly.

Cleaning after using a full roll of TTR media is recommended.

#### **TO CLEAN THE PRINTER:**

1. Remove the printhead cams and the drive roller cam by flipping each cam open to relieve pressure.
2. Do not lock open.
3. Press the silver clip holding each cam, pull the cam completely out, and set aside.

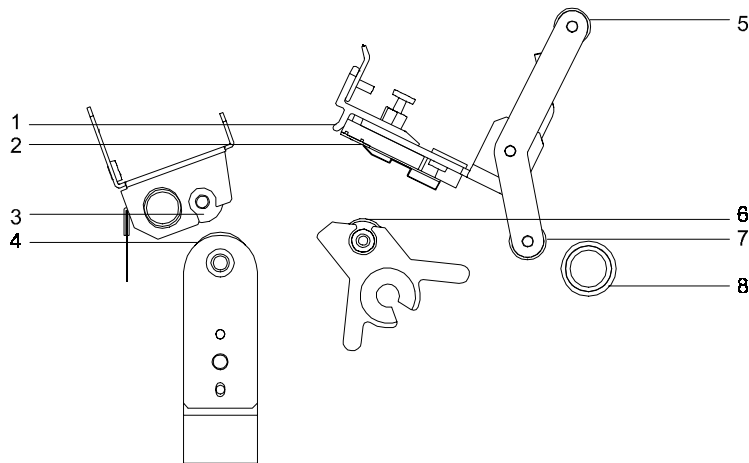


**Figure 17, Printhead Cam**

4. Remove any label media and thermal transfer ribbon from the print path.

5. Use an Astro-Med cleaning pad, a cotton swab, or a soft lint-free cloth wet with isopropyl alcohol and run it on underside of each printhead, especially on the hairline rows of print elements and along the edge of the struts.
6. Also clean the platen rollers, guide rollers, film guide shafts, pressure rollers, and drive rollers.
7. Reinstall any label media and thermal transfer ribbon.
8. Replace the printhead cams and drive roller cam and lock them closed.

**NOTE**      **NEVER USE A HARD OBJECT TO CLEAN THE PRINTHEADS. DAMAGE WILL RESULT IF ACCUMULATED PRINTING RESIDUE IS SCRAPED OR CHIPPED FROM THE PRINTHEAD.**



**Figure 18, Printer Parts that Accumulate the Most Residue**

- |   |                 |   |                 |
|---|-----------------|---|-----------------|
| 1 | printhead strut | 5 | TTR guide shaft |
| 2 | print line      | 6 | platen roller   |
| 3 | pressure roller | 7 | TTR guide shaft |
| 4 | drive roller    | 8 | guide roller    |

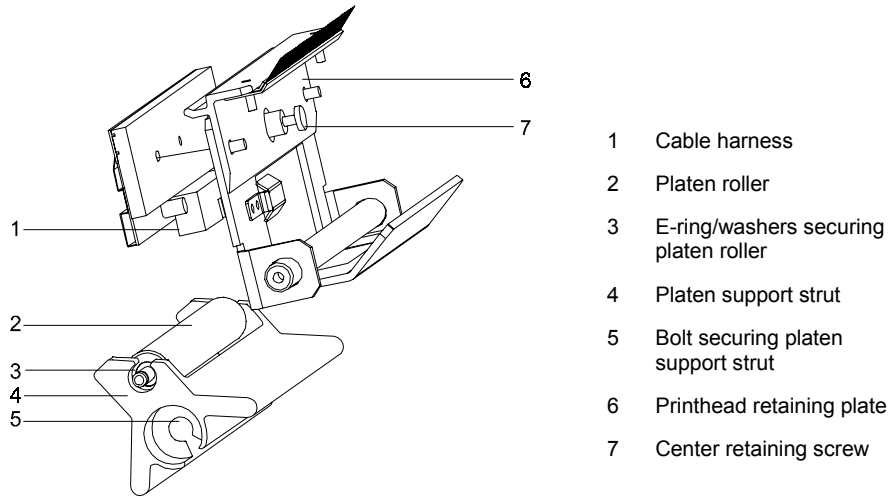
## Replacing Parts

---

### Printheads

#### **TO REMOVE AND REPLACE PRINTHEADS:**

1. Turn the printer off and unplug it.
2. For standard printheads, flip the printhead cam lever counterclockwise to relieve pressure on and open the printhead. For inverted printheads, flip the cam lever clockwise to open the printhead. Do not lock printheads into the up position.
3. Press down the silver clip holding the printhead cam and pull the cam completely out. To provide more maneuverability, the printhead cam on the print station to the right of the printhead you are replacing can also be removed.
4. Remove thermal transfer ribbon currently loaded on the print station.
5. Loosen the center captive retaining screw on the printhead by turning it counterclockwise. Detach the printhead.
6. Be careful not to damage the cable harness that attaches to the printhead. Unplug the printhead cable harness from the printhead. Set the detached printhead aside.
7. Plug the printhead cable harness into the replacement printhead.
8. Position the replacement printhead against the printhead retaining plate for attachment. Be sure that the two side screws are fitted through the corresponding holes in the new printhead.



**Figure 19, Printhead & Platen Roller Installation/Removal**

9. Reinsert and tighten the printhead's captive retaining screw. Be sure the cable harness is not crimped or damaged when the printhead is attached to the printhead plate. The wiring harness should fit through the opening formed when the two pieces are joined.
10. Reinstall label media and thermal transfer ribbon.
11. Reinsert the printhead cam(s) and close the printheads.
12. Plug the printer back in.

**CAUTION    PRINTHEADS CAN BE DAMAGED BY STATIC ELECTRICITY. ALWAYS USE STANDARD ANTI-STATIC PROCEDURES WHEN REPLACING PRINTHEADS.**



## Platen Rollers

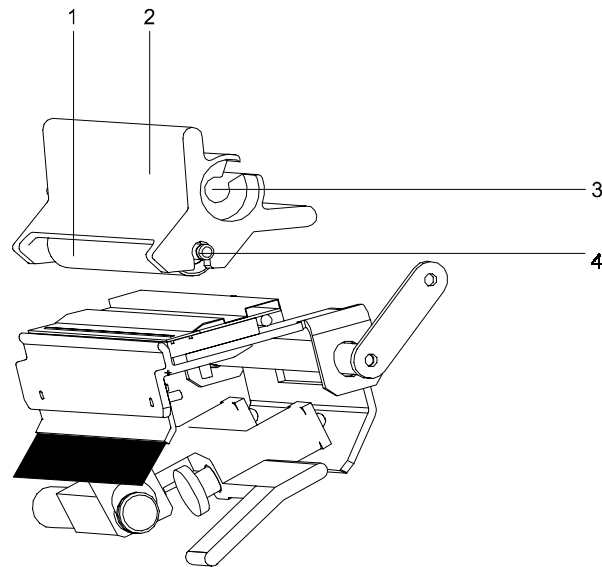
Occasionally, you will need to replace the printhead platen rollers. After prolonged use, one or more rollers may develop flat areas, which will affect print quality.

### **TO REMOVE AND REPLACE THE PLATEN ROLLERS ON STANDARD PRINTHEADS:**

1. Turn the printer off and unplug it.
2. Flip the printhead cam up to open and lock them open.
3. Remove any label stock that may be positioned over the platen roller(s).
4. Release (unlock) the printhead cam(s) but do not lock. Press down the silver clip holding the printhead cam(s) and pull the cam(s) completely out.
5. Lift and hold the printhead assembly or assemblies completely up to the right. With the platen roller now easily accessible, lift it up and out.
6. Gently place the new roller in position. Do not force the roller. Difficult removal or replacement can occur if the roller is held at an angle. To avoid this, lift rollers straight out or drop straight in.
7. Lower the printhead assembly or assemblies.
8. Reinsert the printhead cam and lock closed.
9. Reinstall label media and thermal transfer ribbon as required.
10. Close the printhead and turn the printer On again.

**TO REPLACE THE PLATEN ROLLER ON INVERTED PRINTHEADS:**

1. Turn the printer Off and lift the cover.
2. Flip the printhead cam down and lock open.



**Figure 20, Platen Roller Installation/Removal (Inverted Printhead)**

- 1 Platen roller
- 2 Platen support strut
- 3 Bolt securing platen support strut
- 4 E-ring/washers securing platen roller

3. Remove any label stock that may be positioned under the platen roller.

4. Use a Philips head screwdriver to remove the bracket on the platen roller assembly.
5. The platen roller on the inverted printhead is held in place by a bracket that is screwed over the assembly. Use a Philips head screwdriver to remove the two screws and washers that secure the bracket. Pull the assembly toward you.
11. Remove the old platen roller.
12. Gently place the new roller in position. Replace the bracket over the assembly and reinstall the printhead cam.
13. Reinstall label media and TTR.
14. Flip the printhead cam up and lock closed.

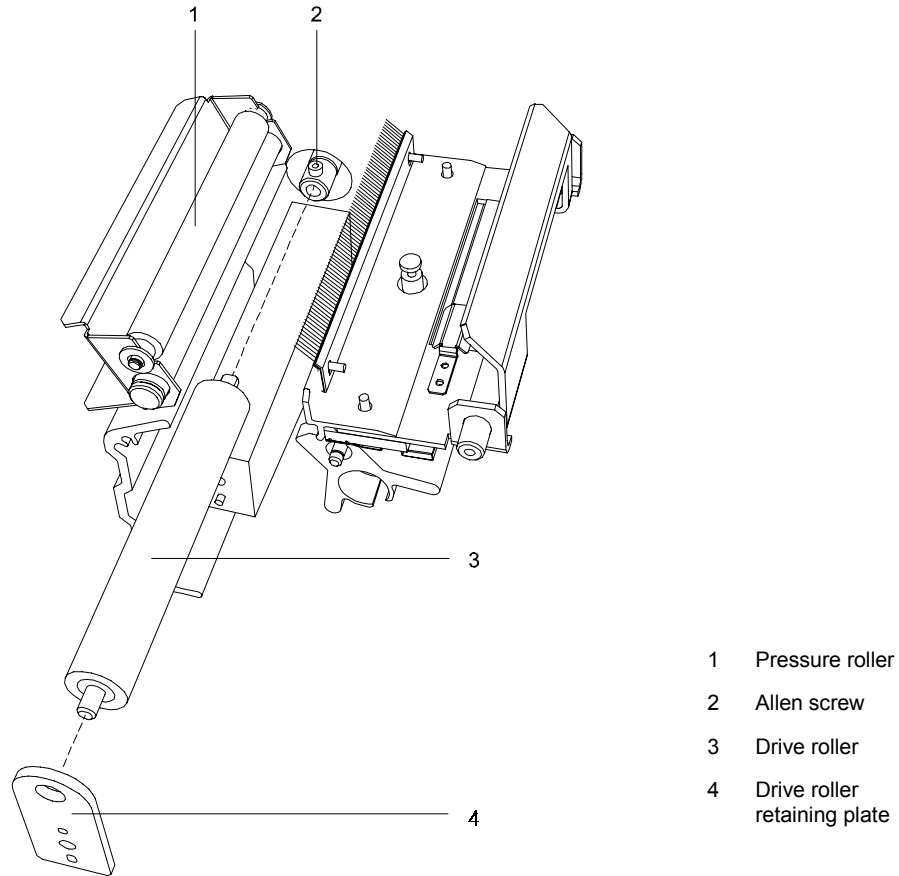
## Drive Roller

After prolonged use, the drive roller and the rubber pressure roller above it may wear. This will impede the smooth exit of label stock. When this occurs, the roller requires replacement.

### **TO REPLACE THE DRIVE ROLLER:**

1. Turn the printer off and unplug it. Open the printer cover.
2. Remove any label stock that may be exiting over the drive roller.
3. Flip the drive roller cam up to relieve pressure on the roller and open it, but do not lock into the open position.
4. Press down the silver clip holding the cam, pull the cam completely out, and set it aside.

5. To provide more room to maneuver, the printhead cam on the print station to the right of the drive roller can also be removed.



**Figure 21, Drive Roller Installation/Removal**

6. To access the drive roller, lift the pressure roller off the drive roller.

7. On the outside of the drive roller, remove the retaining bracket by removing the Phillips screw on the lower portion of the plate. Set the screw and the plate aside.
8. Beside the drive roller, against the inside of the printer, locate the Allen screw. With a 7/64 Allen wrench, loosen the Allen screw until the drive roller easily pulls out.
9. Insert the fresh drive roller, making sure that the roller is fully inserted, with the flat edge of the shaft coming in contact with the Allen screw.
10. Replace the retaining plate, lining up the flange and two small pins and ensuring they are fully inserted into the plate.
11. Reinsert and tighten the Phillips screw.
12. Tighten the Allen screw until the new drive roller is held firmly in place.
13. Reposition the label stock and thread the stock until it exits over the drive roller.
14. Flip the pressure roller back into contact with the drive roller.
15. Reinsert the drive roller cam and lock it into the down position to close the cam.

## Upgrade Firmware

---

Set up and enable communications before upgrading software.

**NOTE      PARALLEL COMMUNICATION PROVIDES CONSIDERABLY  
FASTER DATA TRANSFER RATES.**

## Parallel Upgrade

1. Press Menu. Select System, then select Upgrade.
2. Use the arrow keys to choose Yes to begin upgrading the printer software, or No to cancel. The printer will reset, and the display will read Waiting for parallel data...
3. If you have not already done so, connect the Centronics connector end of the parallel cable to the printer's parallel port. Connect the male 25-pin end of the cable to the desired LPT port on the host computer.
4. If you are not running Windows 95, skip this step. For Windows 95 users:
  1. Select Start, Settings, Control Panel.
  2. Double-click on the Printers icon. With the right mouse button, click on any printer currently assigned to the LPT port to be used. (If you have installed the QLS Windows printer driver, the QLS printer should be set up in this manner.)
  3. Select the Properties menu item, then click on the Details tab in the Properties window.
  4. Click on the Port Settings button. Confirm that the Spool MS-DOS print jobs box is not checked. Exit the dialog.
5. Insert the upgrade diskette into the disk drive. To run the upgrade program, type the word upgrade followed by the LPT port that is being used. Use all lowercase letters. For example, if LPT1 is used, type: upgrade lpt1
6. The computer will begin copying files to the printer, and the printer's Data LED will flash. The printer will display the file it is receiving and the percentage received. When data transmission is finished, the printer will erase, then re-program its flash memory, and reset itself. The printer is now ready for use.

## Serial (RS-232) Upgrade

1. Press Menu. Select System, then select Upgrade.
2. Use the arrow keys to choose Yes to begin upgrading the printer software, or No to cancel. The printer will reset, and the display will read Waiting for serial data...
3. If you have not already done so, connect the male end of the serial cable to the printer's utility I/O port. Connect the female end of the cable to the desired COM port on the host computer. The serial cable must be straight-through (no lines are swapped).
4. Insert the upgrade diskette into the disk drive. To run the upgrade program, type the word upgrade followed by the COM port that is being used and the baud rate. The baud rate should be set to either 9600 or 19.2 k, and the handshake method should be set to Hardware. Use all lowercase letters to run the upgrade program. For example, if COM1 is being used at 19200, type: upgrade com1 19200
5. The computer will begin copying files to the printer, and the printer's Data LED will flash. The printer will display the file that it is receiving and the percentage received. When data transmission is finished, the printer will erase, then re-program its flash memory, and reset itself. The printer is now ready for use.

**NOTE**      **IF YOU ARE NOT RUNNING WINDOWS 95, A BAUD RATE OF 19.2K IS ONLY SUPPORTED IN VERSIONS OF DOS 6.2 AND HIGHER. IF YOU ARE USING A LOWER VERSION OF DOS, A BAUD RATE OF 9600 MUST BE USED.**

## Enable/Disable TTR Sensors

### **TO ENABLE OR DISABLE THE PRINTER'S THERMAL TRANSFER RIBBON SENSORS:**

1. Press Pause to pause the printer.
2. Press the Menu button, select TTR Sensor Enabled or Disabled and press the Select button.



# Chapter 5 Troubleshooting

## Solutions to Common Problems

### Mechanical Problems

**PROBLEM**

Ribbon on one or more of the rewind mandrels is wrinkling.

One or more of the ribbons is breaking.

Label stock is not exiting printer smoothly.

**SOLUTION**

Increase ribbon tension. Do not over-tighten the mandrel or the ink will begin to smudge.

Can occur when ribbon used is two inches wide or less. Decrease ribbon tension.

After prolonged use, the drive roller may develop flat areas, which will impede the smooth exit of label stock. Roller may need to be replaced.

### Poor Print Quality

**PROBLEM**

When increasing heat, a point is reached where the image turns lighter.

One or more of the colors are smudging on the label media.

Light or dark printing on the inner edge of a label.

Light or dark printing on the outer edge of a label.

**SOLUTION**

This is a result of overburning the ink. Decrease the heat intensity to darken the printed image.

Decrease ribbon tension.

Adjust pressure on the printhead's inner thumbscrew.

Adjust pressure on the printhead's outer thumbscrew.

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