Operator Controls

Power Switch

Press *up* to turn **ON** or *down* to turn **OFF** the printer.

CAUTION: The power should be turned off before connecting or disconnecting the communications and power cables.

Feed Button

Forces the printer to feed one blank label.

Takes the printer out of a "pause" condition. (The printer is put into "pause" by either a ZPL II command or an error condition.) See "What the Status Light is Telling You" on page .

Used for printer setup and status (see "Feed Button Modes" on page).

Status Light

Functions as a printer operational indicator (see "What the Status Light is Telling You" on page).
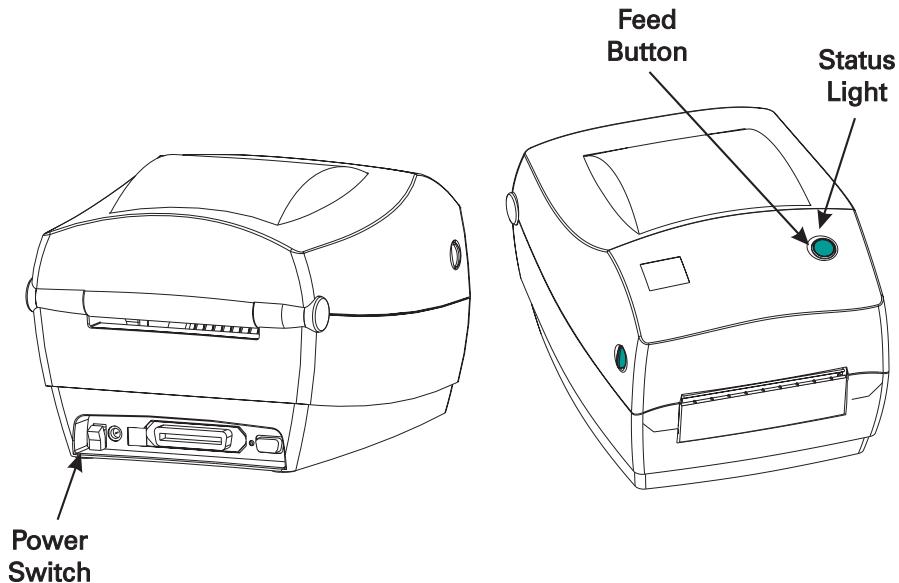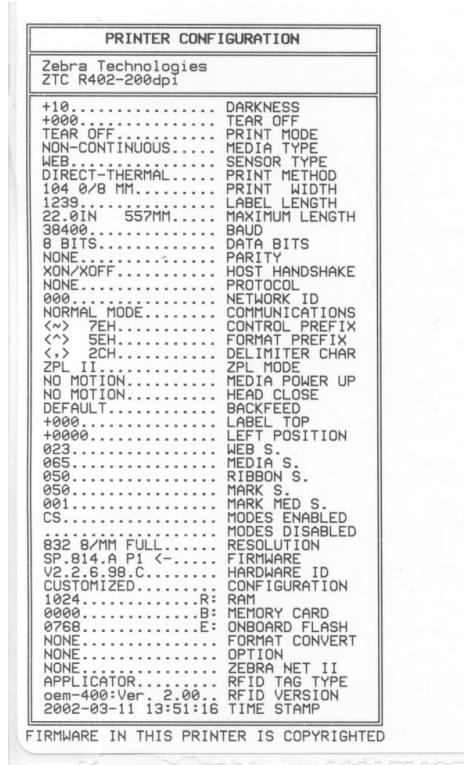
Printing a Test Label

Before you connect the printer to your computer, make sure that the printer is in proper working order. You can do this by printing a configuration label

1. Make sure the media is properly loaded and the top cover of the printer is closed. Then, turn the printer power on if you have not already done so.

2. When the status light is solid green, press and hold the feed button until the status light flashes once.

3. Release the feed button. A configuration label will print.

If you cannot get this label to print, refer to Troubleshooting.

```
            PRINTER CONFIGURATION

     Zebra Technologies
     ZTC R402-200dpi

     +10................ DARKNESS
     +000............... TEAR OFF
     TEAR OFF........... PRINT MODE
     NON-CONTINUOUS..... MEDIA TYPE
     WEB................ SENSOR TYPE
     DIRECT-THERMAL..... PRINT METHOD
     104 0/8 MM......... PRINT  WIDTH
     1239............... LABEL LENGTH
     22.0IN   557MM..... MAXIMUM LENGTH
     38400.............. BAUD
     8 BITS............. DATA BITS
     NONE............... PARITY
     XON/XOFF........... HOST HANDSHAKE
     NONE............... PROTOCOL
     000................ NETWORK ID
     NORMAL MODE........ COMMUNICATIONS
     <~>  7EH........... CONTROL PREFIX
     <^>  5EH........... FORMAT PREFIX
     <,>  2CH........... DELIMITER CHAR
     ZPL II............. ZPL MODE
     NO MOTION.......... MEDIA POWER UP
     NO MOTION.......... HEAD CLOSE
     DEFAULT............ BACKFEED
     +000............... LABEL  TOP
     +0000.............. LEFT POSITION
     023................ WEB S.
     065................ MEDIA S.
     050................ RIBBON S.
     050................ MARK S.
     001................ MARK MED S.
     CS................. MODES ENABLED
     ................... MODES DISABLED
     832 8/MM FULL...... RESOLUTION
     SP.814.A P1 <-..... FIRMWARE
     V2.2.6.98.C........ HARDWARE ID
     CUSTOMIZED......... CONFIGURATION
     1024.............R: RAM
     0000.............B: MEMORY CARD
     0768.............E: ONBOARD FLASH
     NONE............... FORMAT CONVERT
     NONE............... OPTION
     NONE............... ZEBRA NET II
     APPLICATOR......... RFID TAG TYPE
     oem-400:Ver. 2.00.. RFID VERSION
     2002-03-11 13:51:16 TIME STAMP

     FIRMWARE IN THIS PRINTER IS COPYRIGHTED
```

Hooking Up the Printer and Computer

This printer comes with a bidirectional parallel data interface. You must supply the required interface cable for your application.

CAUTIONS:Keep the power switch in the OFF position when attaching the interface cable.

The power supply barrel connector must be inserted into the power supply receptacle on the back of the printer before connecting or disconnecting the communications cables.

This printer complies with FCC "Rules and Regulations," Part 15, for Class B Equipment, using fully shielded six-foot data cables. Use of longer cables or unshielded cables may increase radiated emissions above the Class B limits.

Parallel Interface Requirements

The required cable (IEEE 1284-compliant is recommended) must have a standard 36-pin parallel connector on one end, which is plugged into the parallel port located on the back of the printer. The other end of the parallel interface cable connects to the printer connector at the host computer.

For pinout information, refer to page .

Interface Cable Requirements

Data cables must be of fully shielded construction and fitted with metal or metalized connector shells. Shielded cables and connectors are required to prevent radiation and reception of electrical noise.

To minimize electrical noise pickup in the cable:

Keep data cables as short as possible (6' [1.83 m] recommended).

Do not tightly bundle the data cables with power cords.

Do not tie the data cables to power wire conduits.
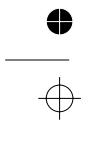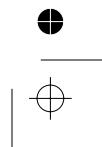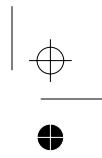
Communicating with the Printer

When using the parallel port, typically there is no setup is required once the cable is plugged in. If you should encounter any problems, consult the user's guide that came with your computer.

Adjusting the Print Width

Print width must be calibrated when:

- You are using the printer for the first time.
- There is a change in the width of the media.

Print width may be set by way of the five-flash sequence in "Feed Button Modes" (see page) or refer to the Print Width (^PW) command (consult your ZPL II Programming Guide).

Adjusting the Print Darkness

The relative darkness setting is controlled by either the six-flash sequence in "Feed Button Modes" (see page) or the Set Darkness (~SD) ZPL II command (follow the instructions in the ZPL II Programming Guide).

Adjusting the Print Speed

Print quality is affected by print speed and the media you are using. Only by experimenting will you find the optimal mix for your application.

If you find that the print speed needs to be adjusted, refer to the Print Rate (^PR) command in the ZPL II Programming Guide.
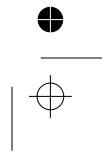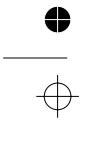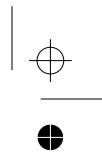
Operation & Options

This section helps you get the most from your printer.

You must use programming to control many of the printer's functions. For example, the ~JL command controls label length. For detailed information about creating labels using ZPL II, refer to the ZPL II Programming Guide or visit our web site at www.zebra.com.

To improve print quality, changing both print speed and density may be required to achieve the desired results. Your application's printer driver provides control of the speed and heat (density).

Thermal Printing

The print head becomes hot while printing. To protect from damaging the print head and risk of personal injury, avoid touching the print head. Use only the cleaning pen to perform maintenance.

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. You must observe static-safe procedures when working with the print head or the electronic components under the top cover.

You must use the correct media for the type of printing you require. When printing without a ribbon, you must use direct thermal media. When using ribbon, you must use thermal transfer media. The printer's ribbon sensor detects motion of the supply spindle.
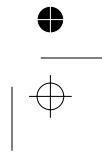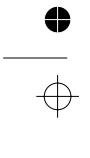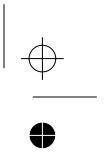
Replacing Supplies

If labels or ribbon run out while printing, leave the printer power on while reloading (data loss results if you turn off the printer). The printer automatically restarts after you load a new label or ribbon roll.

Always use high quality, approved labels, tags and ribbons. If adhesive backed labels are used that don't lay flat on the backing liner, the exposed edges may stick to the label guides and rollers inside the printer, causing the label to peel off from the liner and jam the printer. Permanent damage to the print head may result if a non-approved ribbon is used as it may be wound incorrectly for the printer or contain chemicals corrosive to the print head. Approved supplies can be ordered from your dealer.

Adding a New Transfer Ribbon

If ribbon runs out in the middle of a print job, the indicator lights orange and the printer waits for you to add a fresh roll.

1. Keep the power on as you change ribbon.

2. Open the top cover, then cut the used ribbon so you can remove the cores.

3. Load a new ribbon roll. Refer to page for this procedure.

4. Close the top cover.

5. Press the Feed button to restart printing.

Replacing a Partially Used Transfer Ribbon

To remove used transfer ribbon, perform the following steps.

1. Cut the ribbon from the take-up roll.

2. Remove the take-up roll and discard used ribbon.

3. Remove the supply roll and tape the end of any fresh ribbon to prevent it from unwrapping.

When reinstalling a partially used supply roll, tape the cut end onto the empty take-up roll.
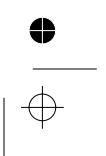
Printing in Peel-Mode
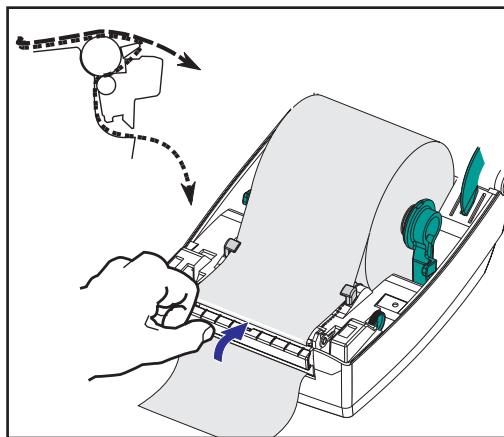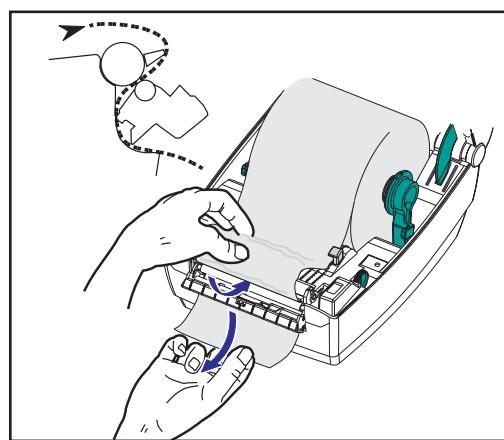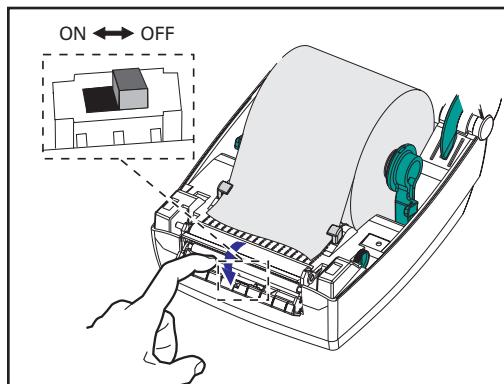
The optional dispenser allows you to print in "peel-mode" where the label backing follows a different path and the labels are presented one at a time for subsequent placement.

1. Remove several labels from the backing material.

2. Open the top cover.

3. Open the dispenser door.

4. Switch on the label-taken sensor.

5. Insert the backing in front of the peel bar and behind the peel roller.

6. Close the dispenser door.

7. Close the top cover.

8. Press the Feed button to advance the label.

During the print job, the printer will peel off the backing and present a single label. Take the label from the printer so it will print the next label.

Printing on Fan-Fold Media
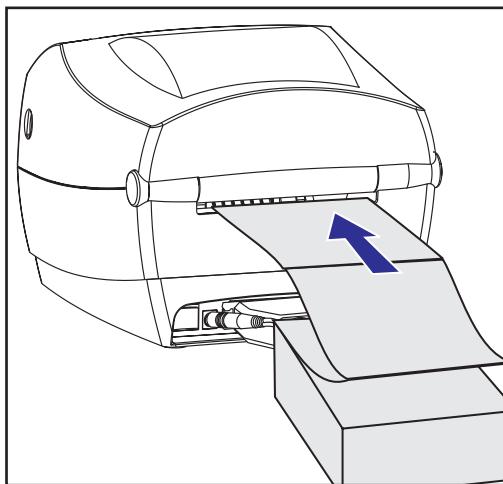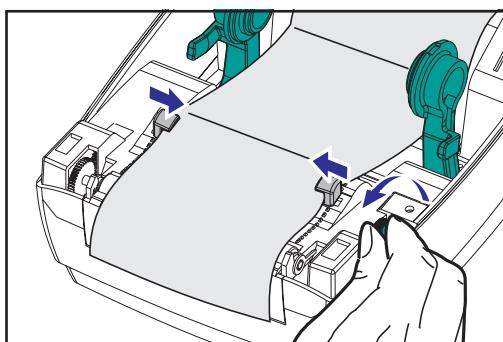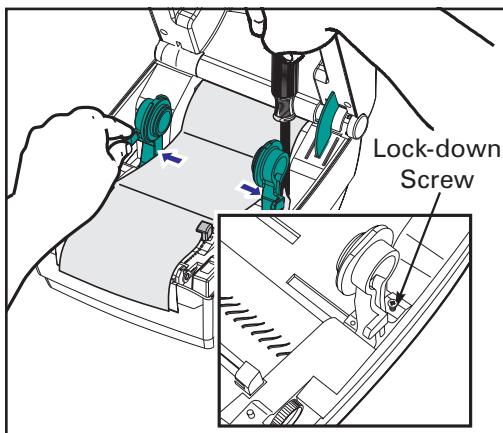
Printing on fan-fold media requires you to set both the media hangers and the media guides in position.

1. Open the top cover.

2. With a sample of your media, adjust the media hangers to the width of the media. The hangers should just touch, but not restrict, the edges of the media.

3. Tighten the screw using a small Phillips driver #1.

4. With a sample of your media, adjust the guides to the width of the media. The guides should just touch, but not restrict, the edges of the media.

5. Insert the media through the slot at the rear of the printer.

6. Run the media between the hangers and guides.

7. Close the top cover.

Lock-down Screw

RFID Guidelines

RFID is an abbreviation for *radio frequency identification*. To use the RFID capabilities of this printer, you will need the appropriate media which have incorporated into them a transponder.

These RFID transponders have coils built into them. You can write data to (encode) and read data from the transponder's memory, and obtain certain information regarding the status of the RFID subsystem. This printer has an antenna that encodes the transponder within the media. When a transponder lines up over the antenna, you are able to communicate to it to get information and write to the transponder.

Following your *Zebra Programming Language* (ZPL) commands, the printer first transfers data to the RFID transponder in the media, then prints bar code and human-readable data on the media.
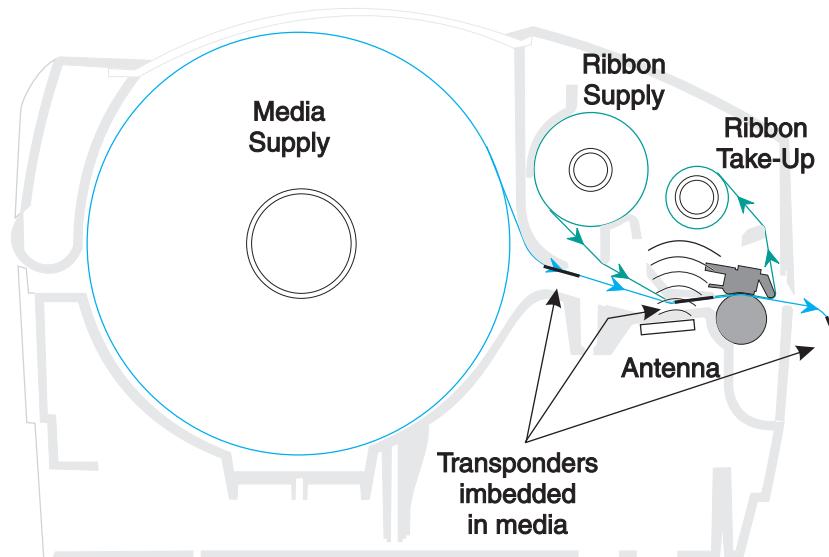
Each transponder has blocks that are written and read through ZPL commands. The ZPL commands allow you to adjust the number of retries to get a successful execution of the command. If a block cannot be written within the number of retries, then the media is fed out with a VOID type error message.

After the printer feeds the failed media, the printer attempts to write to another transponder in the next label, tag, or ticket. The rewriting follows the same series of commands, and the same number of retries for each block. If the printer fails to program this transponder, then the printer also feeds this media with a VOID message. The printer attempts one final attempt time to write (encode), and if unsuccessful, prints a third VOID media.

No customer format information appears on media that fails to be written. After three VOID feeds, the printer removes the customer format from the print queue, and proceeds with the next format (if one exists in the buffer).

Supported Transponders

The R402 supports several transponder types:

- Tag-it
- I•Code
- Picotag 2K
- ISO 15693

Tag-it Transponders

Tag-it labels are high frequency (13.56MHz) devices. Tag-it is a read/write RFID transponder with 256 bits of storage capacity for user data. Data is addressed in eight blocks of 32 bits, each block containing four bytes.

Tag-It Blocks		
Block #	Description	Bytes
0	User Data	32 User
1	User Data	
2	User Data	
3	User Data	
4	User Data	
5	User Data	
6	User Data	
7	User Data	

I Code Transponders

I-Code transponders are high frequency (13.56MHz) devices but have 512 bits of storage capacity. Data is addressed in sixteen blocks of 32 bits, each block containing four bytes. The first two blocks of data (block 0 and 1) are used for storage of a unique 64 bit serial number. The next two blocks (blocks 2 and 3) are used for storage of configuration information; block 4 is used for family or application identification and blocks 5 to 15 are free for user application use.

If you are using I-Code transponders for your own use, and don't require universal special function or family codes, then you can program blocks 3 through 15.
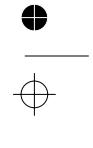
I-Code Blocks		
Block #	Description	Bytes
0	Serial Number (write protected)	
1	Serial Number (write protected)	
2	Write Protect Block (Caution*)	
3	Special Function Block	8 Optional
4	Family Code	
5	User Data	
6	User Data	
7	User Data	
8	User Data	
9	User Data	
10	User Data	40 User
11	User Data	
12	User Data	
13	User Data	
14	User Data	
15	User Data	

* The bits in block 2 determine the write access conditions for itself and each of the remaining blocks. You can leave blocks 2 through 15 open or you can write-protect them. Write-protected blocks (included block 2) can never be written to from the moment they are locked

Picotag Transponders

Picotag transponders use 13.56 MHz frequency. For details regarding this transponder, refer to the INSIDE TECHNOLOGIES specification.

Picotag 2K								
Block	Byte number within a block							
	0	1	2	3	4	5	6	7
0	Serial Number (64 bits)							
1	FFh	Application 16-bit OTP Area		Block Write Lock	Tun-ing Cap	1Fh	E.A. S.	Fuses
2	Application Issuer Area							
3	Application Area							
4								
5								
6	Block Write Lockable Application Area							
7								
8								
9								
10								
11								
12								
13	Application Area							
...								
31								

ISO-15693 Transponders

You can use up to 256 blocks or use one block size up to 256 bits (32 bytes). There is no definite memory map organization as it depends on what you might implement.

ZPL II Commands for RFID

^WT – Write Tag

The format for the ^WT instruction is: **^WTb,r,m,w,s**

where

> ^WT = Write Tag command

> b = Block Number
>> Default value: 0
>> Other values: 1 to n, where n is the maximum number of blocks for the tag

This is the starting block number. If the user sends more than a block of data it will overflow into the next block. If the user overflows the block and subsequent blocks cause errors (write protects, beyond range, etc.), the write will be aborted, but blocks already written will not revert to original contents. It's up to the caller to ensure blocks aren't accidentally overwritten.

> r = Retries
>> Default value: 0
>> Other values: 1 to 10, number of retries

> m = motion
>> Default value: 0 (Feed label after writing)
>> Other value: 1 (No Feed after writing, other ZPL may cause a feed)

> w = Write protect
>> Default value: 0 (NOT write protected)
>> Other value: 1 (Write protect)

> s = Special mode
>> Reserved

^RT – Read Tag

The format for the ^RT instruction is: **^RT#,b,n,f,r,m,s**

where

^RT = Read Tag command

= Number to be assigned to the Field
    Default value: 0
    Other Values: 1 to 9999

b = Starting Block Number
    Default value: 0
    Other values: 1 to n, where n is the maximum number of
    blocks for the tag

n = Number of blocks to read
    Default value: 1
    Other values: 2 to n, where n is maximum number of blocks
    minus starting block number. In other words, if the tag has 8
    blocks (starting with block 0) and you're starting with block 6,
    n can be 2. This would give you block 6 and block 7
    information.

f = Format
    Default value: 0 ASCII
    Other values: 1 Hexadecimal

r = Retries
    Default value: 0
    Other values: 1 to 10, number of retries

m = motion
    Default value: 0 (Feed label after writing)
    Other value: 1   (No Feed after writing, other ZPL may cause
    a feed)

s = Special Mode
    Default value: 0
    Other values: 1 to 255, to specify more detailed mode control.

Example: This reads a block from a tag, and prints it on a label:

^XA

^FO20,120^A0N,60^FN1^FS

^FO20,100^A0N,20^FN2^FS

^RT1,0,7,3,0,5,0,0^FS

^RT2,0,2,2,0,5,0,0^FS

^XZ

The first ^RT command automatically detects the tag type, starting at block 7, reads three blocks of data in ASCII format. It will retry the command 5 times if necessary. A "void" label will be generated if the read is unsuccessful after 'r' retries. The data read will go into the ^FN1 location of the recalled format.

The second ^RT command automatically detects the tag type, string at block 2, reads two blocks of data in ASCII format. It retries up to 5 times. The data read will go into the ^FN2 location of the recalled format.

The data can be sent back to the host via the ^HV command.

^RS – RFID Setup

The format for the ^RS instruction is: **^RSt**

where

t = tag type
> Default value: 0 –NONE (No tags available)
> Other values:
>> 1- Auto detect (automatically determine the
>>> tag type, by querying the tag)
>> 2- Tag-it (Texas Instruments Tag-it tags)
>> 3- I •Code (Philips I·Code tags)

^RI – RFID Get Tag Unique ID

The format for the ^RI instruction is: **^RIn**

where

n = field number to store the unique ID
> The unique ID will be read from the tag and available to
> print or return to the host computer.

Example: This reads a block from a tag, and prints it on a label:

> **^XA**

^FO100,100^A0N, 60^FN0^FS

^RI0^FS

^XZ

Sample of RFID Programming

ZPL II™ is Zebra Technologies Corporation's Zebra Programming Language II label design language. ZPL II lets you create a wide variety of labels from the simple to the very complex, including text, bar codes, and graphics.

This section is not intended as an introduction to ZPL II. If you are a new ZPL II user, order a copy of the ZPL II Programming Guide (part# 46530L) or go to the internet address http://support.zebra.com and select the Documentation Button to download the guide.

For your programming, do the following:

1. Set up the printer and turn the power on.

2. Use any word processor or text editor capable of creating ASCII-only files (ex: Microsoft Word® and save as a .txt file) and type in the label format exactly as shown in the sample label format that follow.

3. Save the file in a directory for future use. Use the ".zpl" extension.

4. Copy the file to the printer.

    From the DOS command window, use the "COPY" command to send a file to the Zebra printer. For example, if your file name is **format1.zpl** then type, "COPY FORMAT 1.ZPL XXXX", where "XXXX" is the port to which your Zebra printer is connected, for example, "COM1" or "LPT1."

5. Compare your results with those shown. If your printout does not look like the one shown, confirm that the file you created is identical to the format shown, then repeat the printing procedure. If nothing prints, refer to the "Getting Started" section to make sure your system is set up correctly, otherwise refer to the "Troubleshooting and Diagnostics" section.

Line #	Type this label format	Resulting printout
1.	^XA	
2.	^WT6^FDZebra^FS	
3.	^FO100,100^A0n,60^FN0^FS	ZEBRA
4.	^FO100,200^A0n,40^FN1^FS	
5.	^RT0,6,2^FS	5A65627261000000
6.	^RT1,6,2,1	
7.	^XZ	

Line 1 Indicates start of label format.

Line 2 Writes the data "Zebra" to block 6 for the tag (one byte will spill into block 7, since we have 4 bytes/block.

Line 3 Print field number '0' at location 100,100. ^FN0 is replaced by what we read on line #5.

Line 4 Print field number '1' at location 100,200. ^FN1 is replaced by what we read on line #6.

Line 5 Read Tag into field number 0, starting at block 6, lasting for 2 blocks in ASCII format (default).

Line 6 Read Tag into field number 1, starting at block 6, lasting for 2 blocks in hexadecimal format.

Line 7 End of label format.

Maintenance

Cleaning

Use only the cleaning agents indicated. Zebra Technologies Corporation will not be responsible for damage caused by any other cleaning materials used on this printer.

| Printer Part	Method	Interval
Print head	After allowing the print head to cool for approximately one minute, use 70% isopropyl alcohol on a cotton swab to clean the print elements from end to end (the print elements are located in the thin gray line on the print head). **NOTE:** *You do not have to turn off the printer to do this.* If print quality has not improved after performing this procedure, try cleaning the print head with Save-a-Print Head cleaning film. This specially coated material removes contamination buildup without damaging the print head. Call your authorized reseller for more information.	After every five rolls of media
Platen roller	Manually rotate the platen roller. Clean it thoroughly with 70% isopropyl alcohol and a cotton swab or lint-free cloth.	
Peel bar	Clean it thoroughly with 70% isopropyl alcohol and a cotton swab.	As needed
Tear bar	Clean it thoroughly with 70% isopropyl alcohol and a cotton swab.	
Exterior	Water-dampened cloth	
Interior	Brush or air blow	

Lubrication

No lubricating agents of any kind should be used on this printer! Some commercially available lubricants, if used, will damage the finish and the mechanical parts inside the printer.

Parts List

ITEM	DESCRIPTION	PART NUMBER
1	Latch Assembly	105910-052
2	Feed Switch/Sensor Assy (set of 3)	105910-064
3	Upper Cover Support (set of 3)	105910-066
4	Print Head Assy - 4" TLP Print Head Cable Assy.	105910-053 105910-065
5	Head Up Sensor	105910-072
6	Gap/Blackline Sensor PCBA (set of 3)	105910-054
7	Platen Kit (standard set of 3) Platen Kit, Liner Free	105910-055 105910-056
8	Front Bezel (standard set of 10) Front Bezel, Dispenser (single)	105910-057 105910-022
9	Housing, Base (set of 3)	105910-058
10	Rubber Foot Kit (set of 24)	105910-007
11	Main Control PCBA (RFID)	
12	Bottom Frame Assy	105910-059
13	Upper Cover Assy	105910-060
14	Ribbon Out Sensor (set of 3)	105910-067
15	Ribbon Carriage w/o printhead	105910-061
Not Shown	Motor (set of 2) Power Supply, 100V-240V Power Cord, U.S. 120V IEC320C13 (set of 5) User's Manual, R402 ZPL II Programmer's Manual	980389-001 46530L

15   1

2

14

13   3

4

5

6

12

7

8

11

9

10
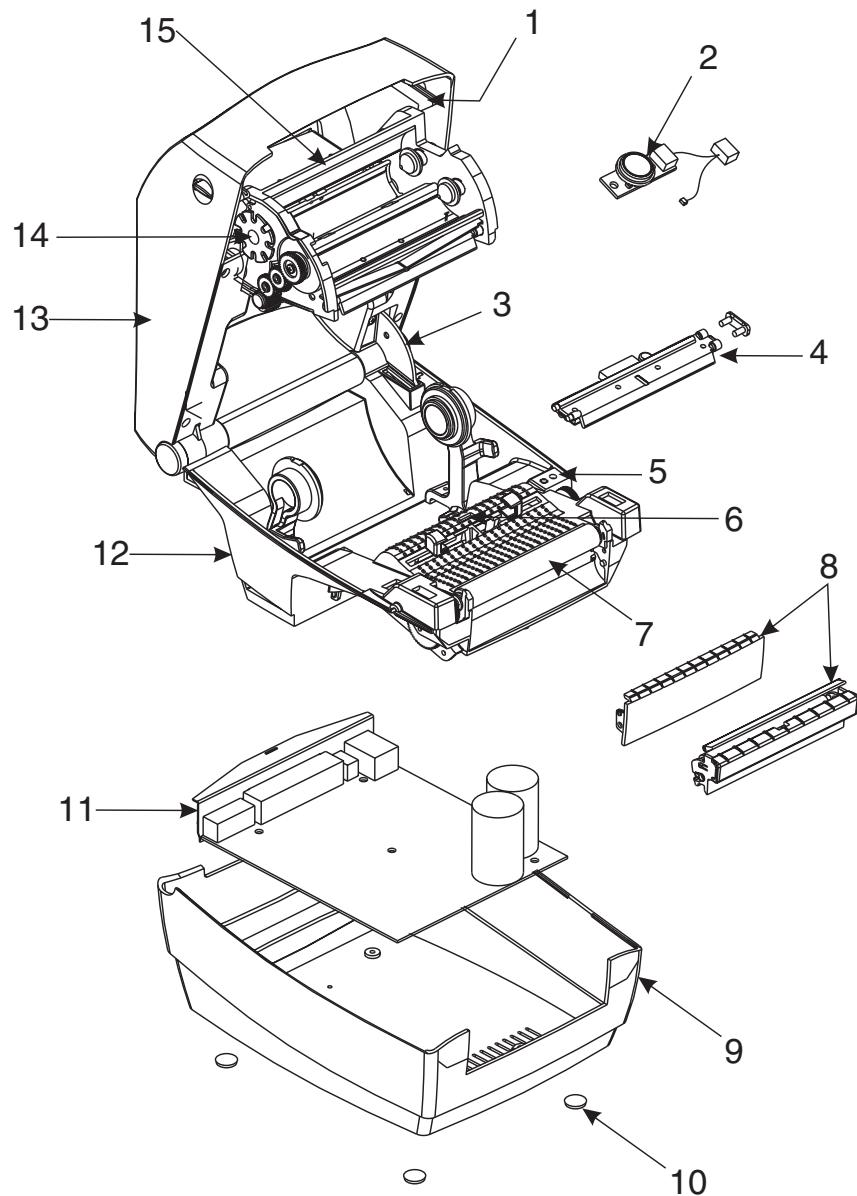
Replacing the Print Head
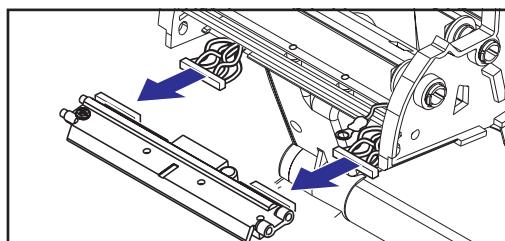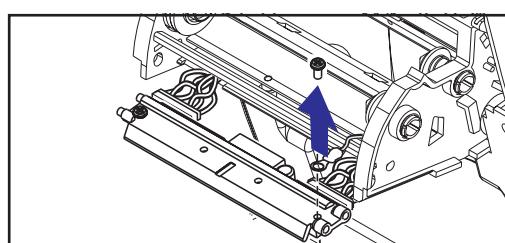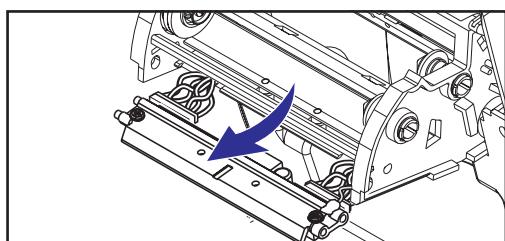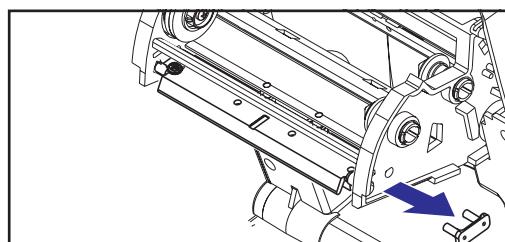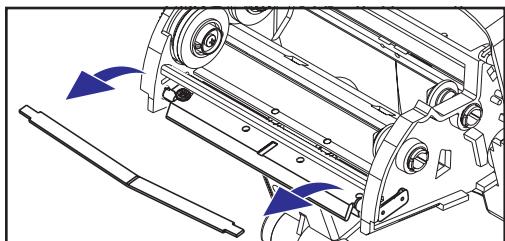
In the event you need to replace the print head, make sure your work area is prepared by protecting against static discharge. Your work area must be static-safe and include a properly grounded conductive cusioned mat to hold the printer a conductive wrist strap for yourself.

Removal

Before following the steps in this procedure, open the printer by pulling the release latches forward then lifting the top cover. Remove any ribbon from the carriage.

1. Grasp the print head spring and pull it to the left; then, slide it free of the carriage.

2. Use the spring to pry the print head clip off the right side of the carriage.

3. Pull the print head and bracket forward.

4. Use a #2 Phillips driver to remove the screw that holds the ground wire.

5. Unplug both bundles of print head wires from their connectors.

Assembly
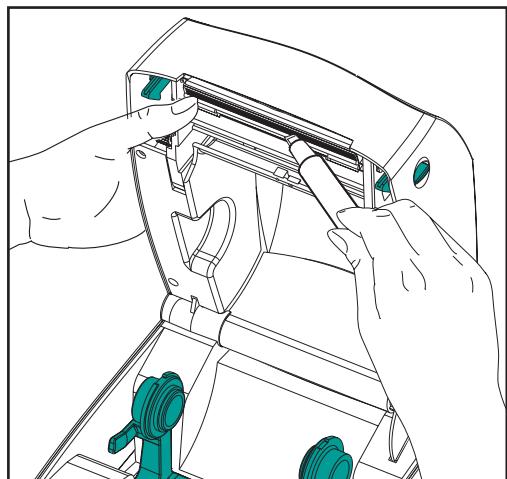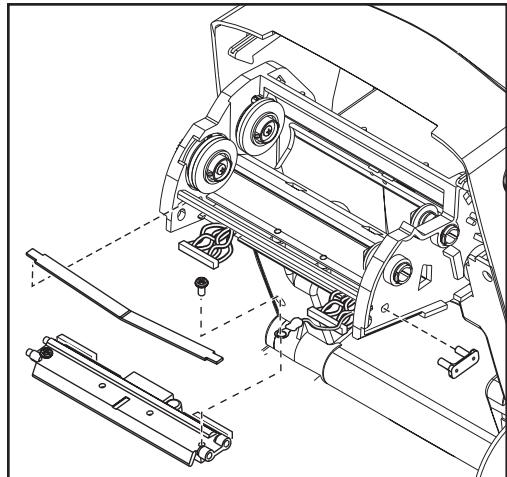
The new print head comes with the clip and ground screw attached.

1. Align the print head and bracket to plug the left and right connectors into the black and white wire bundles.

2. Attach the ground wire and secure it with the screw. Use a #2 Phillips driver to tighten it.

3. Insert the bracket pegs into the left side of the carriage.

4. Align the right side of the bracket and insert the print head clip through the right side of the ribbon carriage into the bracket.

5. Slip the left end of the print head spring into the left side of the ribbon carriage; then slide the right end into the other side. The angle of the "v" fits into the indent on top of the print head bracket.

6. Clean the print head with the cleaning pen.

Reload media and ribbon. Plug in the power cord, turn on the printer and run an automatic or manual calibration to ensure proper function.
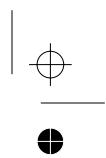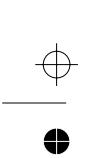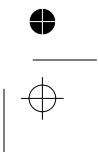
Troubleshooting

What the Status Light is Telling You		
Status LED Condition and Color	Printer Status	For a Resolution, Refer to:
Off	Off	1
Solid Green	On	2
Flashing Yellow	Stopped	3
Flashing Green	Normal Operation	4
Flashing Red	Stopped	5
Double Flashing Green	Paused	6
Solid Yellow	Various	7
Alternately Flashing Green and Red	Needs Service	8

Resolutions

1. *The printer is not receiving power.*

- Have you turned on the printer power?

- Check power connections from the wall outlet to the power supply, and from the power supply to the printer.

2. *The printer is on and in an idle state.*
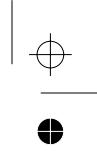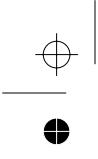
3. The printer has failed its power on self test (POST).

- If this error occurs right after you turn on the printer, contact an authorized reseller for assistance.

There is a shortage of memory.

- If this error occurs after you have been printing, turn the printer power off and on. Then, resume printing.

4. The printer is receiving data.

- As soon as all of the data has been received, the status LED will turn green; then, the printer will automatically resume operation.
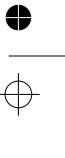
5. The media is out.

- Load a roll of media, following the instructions in "Loading the Media" on page . Then, press the feed button to resume printing.
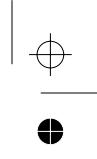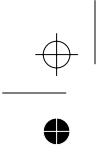
The print head is open.

- Close the top cover. Then, press the feed button to resume printing.

6. The printer is paused.

- Press the feed button to resume printing.

7. *The print head is under temperature.*

- Continue printing while the print head reaches the correct operating temperature.
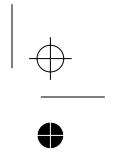
The print head is over temperature.

- Printing will stop until the print head cools to an acceptable printing temperature. When it does, the printer will automatically resume operation.

8. *FLASH memory is not programmed.*

- Return the printer to an authorized reseller.
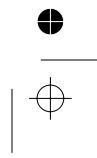
Print Quality Problems

No print on the label.

- You must use the correct media for the method of printing you require. When printing without a ribbon, you must use direct thermal media. When using ribbon, you must use thermal transfer media. The printer's ribbon sensor detects motion of the supply spindle.

- Is the media loaded correctly? Follow the instructions in "Loading the Media" on page .

The printed image does not look right.

- The print head is dirty. Clean the print head according to the instructions on page .

- The print head is under temperature.

- Adjust the print darkness and/or print speed. Refer to the six-flash sequence in "Feed Button Modes" on page 50, or the ^PR and ~SD commands in the ZPL II Programming Guide.

- The media being used is incompatible with the printer. Be sure to use the recommended media for your application, and always use Zebra-approved labels and tags.

There are long tracks of missing print (blank vertical lines) on several labels.

- The print Head is dirty. Clean the print Head according to the instructions on page .

- The print Head elements are damaged. Replace the print Head (see "Replacing the Print Head" on page).
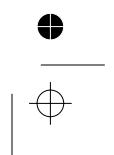
The printing does not start at the top of the label, or misprinting of one to three labels.

- The media may not be threaded under the media guides. Refer to "Loading the Media" on page .

- The printer needs to be calibrated. Refer to "Auto Calibration" on page .

- The correct media sensor may not be activated. Manual calibration selects the media sensing method for the labels being used (refer to the ^MN command in the ZPL II Programming Guide).

- Verify that the Label Top (^LT) command is correctly set for your application (consult the ZPL II Programming Guide).

A label format was sent to, but not recognized by, the printer.

- Is the printer in pause mode? If so, press the feed button.

- If the status LED is on or flashing, refer to "What the Status LED is Telling You" on page 50.

- Make sure the data cable is correctly installed.

- A communications problem has occurred. First, make sure that the correct communications port on the computer is selected. Next, verify that the same handshaking is in use by both the printer and the computer. Then, ensure that the baud rates of the printer and the computer match. Refer to "Communicating with the Printer" on page .
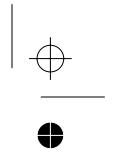
RFID Symptoms

RFID tags generally not programmed

- Is the printer set up correctly? Print a status page to verify RFID version.

- Check if supported RFID media is loaded correctly.

VOID messages are printed across media.

- Verify tag type is properly selected in ZPL II. Use RFID media with supported tag type. Edit ZPL II to select proper tag type or increase retries.

- ZPL II is attempting to write to a non-existent block. Some tags' blocks are identified as 0-7. If ZPL II attempts to write to block "8," it will fail.

- Verify voided tag on external reader. Discard bad tags if this is a media problem.

Nothing is printed.

- See if the correct media is loaded or load new, fresh media.

- See if tags can be read/programmed using other hardware.

- Verify ZPL II RFID commands. Debug the printing program.

- Tag is out of reach of the antenna or too close. Verify tag alignment.

- Wrong type of tag was selected. Check ZPL II.

- Block is write protected. Ensure that the tag is not write protected.

- Aluminum and other metals within tag may interfere with read/write. Make sure media meet requirements.

- Increase the number of retries in the ZPL II commands.

- Time out may have occurred during internal communication. Cycle power and try printing label again.

Call a service technician if you have been unsuccessful in getting your expected print out and data.
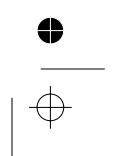
Manual Calibration

Manual calibration is recommended whenever you are using pre-printed labels (or label backing) or if the printer will not correctly auto calibrate.

1. Turn on the printer power.

2. Remove approximately 4" (102 mm) of labels from a section of backing material. Load the media so that only the backing material is threaded through the printer and under the print Head.

3. Press and hold the feed button until the green status LED flashes once, then twice. Release the feed button.

4. The printer will set the media sensor for the label backing being used. After it is done making this adjustment, the roll will automatically feed until a label is positioned at the print Head.

5. A profile of the media sensor settings (similar to the example below) will print. Upon completion, the printer will save the new settings in memory and the printer is ready for normal operation.

6. Press the feed button. One entire blank label will feed. If this does not happen, try defaulting (refer to the four-flash sequence in "Feed Button Modes" on page 50) and recalibrating the printer.

NOTE: Performing a manual calibration disables the auto calibration function. To return to auto calibration, default the printer (see the four-flash sequence in "Feed Button Modes" on page 50).
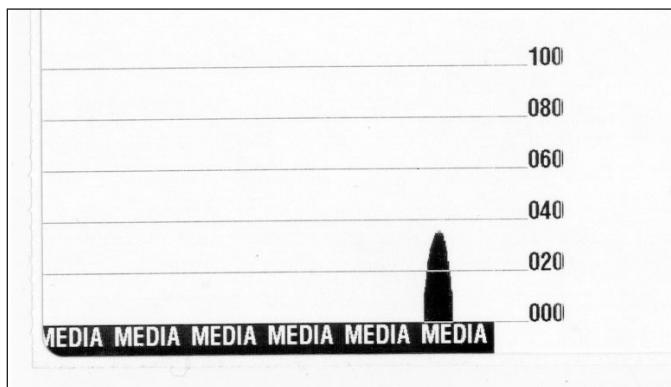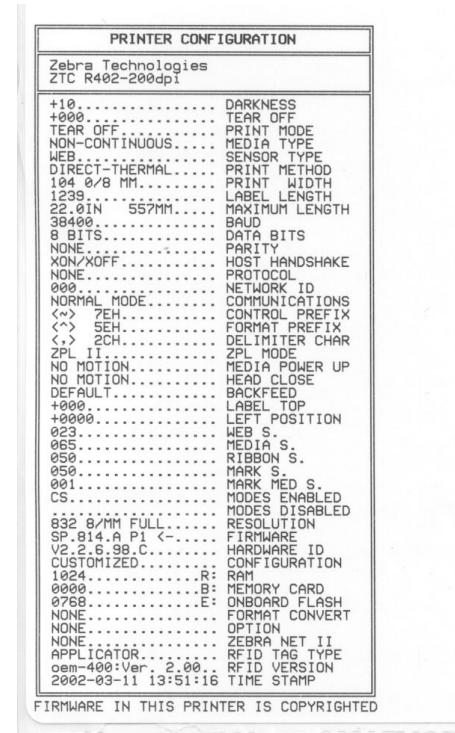
Troubleshooting Tests

Printing a Configuration Label

To print out a listing of the printer's current configuration, refer to the one-flash sequence in "Feed Button Modes" on page 50.

Recalibration

Recalibrate the printer if it starts to display unusual symptoms, such as skipping labels. See "Auto Calibration" on page .

```
          PRINTER CONFIGURATION

 Zebra Technologies
 ZTC R402-200dpi

 +10................. DARKNESS
 +000................ TEAR OFF
 TEAR OFF............ PRINT MODE
 NON-CONTINUOUS...... MEDIA TYPE
 WEB................. SENSOR TYPE
 DIRECT-THERMAL...... PRINT METHOD
 104 0/8 MM.......... PRINT  WIDTH
 1239................ LABEL LENGTH
 22.0IN    557MM..... MAXIMUM LENGTH
 38400............... BAUD
 8 BITS.............. DATA BITS
 NONE................ PARITY
 XON/XOFF............ HOST HANDSHAKE
 NONE................ PROTOCOL
 000................. NETWORK ID
 NORMAL MODE......... COMMUNICATIONS
 <~>   7EH........... CONTROL PREFIX
 <^>   5EH........... FORMAT PREFIX
 <,>   2CH........... DELIMITER CHAR
 ZPL II.............. ZPL MODE
 NO MOTION........... MEDIA POWER UP
 NO MOTION........... HEAD CLOSE
 DEFAULT............. BACKFEED
 +000................ LABEL TOP
 +0000............... LEFT POSITION
 023................. WEB S.
 065................. MEDIA S.
 050................. RIBBON S.
 050................. MARK S.
 001................. MARK MED S.
 CS.................. MODES ENABLED
 .................... MODES DISABLED
 832 8/MM FULL....... RESOLUTION
 SP.814.A P1 <-...... FIRMWARE
 V2.2.6.98.C......... HARDWARE ID
 CUSTOMIZED.......... CONFIGURATION
 1024.............R: RAM
 0000.............B: MEMORY CARD
 0768.............E: ONBOARD FLASH
 NONE................ FORMAT CONVERT
 NONE................ OPTION
 NONE................ ZEBRA NET II
 APPLICATOR.......... RFID TAG TYPE
 oem-400:Ver. 2.00.. RFID VERSION
 2002-03-11 13:51:16 TIME STAMP

 FIRMWARE IN THIS PRINTER IS COPYRIGHTED
```

Resetting the Factory Default Values

Sometimes, resetting the printer to the factory defaults solves some of the problems. Follow the four-flash sequence instructions in "Feed Button Modes" on page 50.

Communications Diagnostics

If there is a problem transferring data between the computer and printer, try putting the printer in the communications diagnostics mode. The printer will print the ASCII characters and their respective hexadecimal values (a sample is shown in Figure 23) for any data received from the host computer. To find out how, refer to the power off mode procedure in "Feed Button Modes" on page 50.

```
^FS^F0394,25^AA
5E 46 53 5E 46 4F 33 39 34 2C 32 35 5E 41 41

N,18,10^FD(0000
4E 2C 31 38 2C 31 30 5E 46 44 28 30 30 30 30

)999-9999^FS
29 39 39 39 2D 39 39 39 39 5E 46 53 0D 0A

^F00,50^AAN,18,
5E 46 4F 30 2C 35 30 5E 41 41 4E 2C 31 38 2C

10^FDCENTER STA
31 30 5E 46 44 43 45 4E 54 45 52 20 53 54 41
```
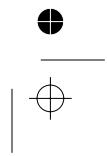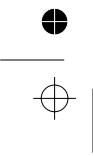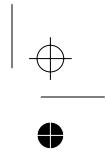
Feed Button Modes

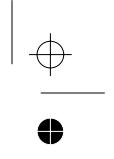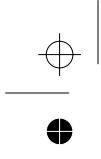| Power Off Mode (Communications Diagnostics Mode) |
|---|
| With the printer power off, press and hold the feed button while you turn on the power. The printer prints out a listing of its current configuration (see Figure 22). After printing the label, the printer will automatically enter a diagnostic mode in which the printer prints out a literal representation (see Figure 23) of all data subsequently received. To exit the diagnostic mode and resume printing, turn off and then turn on the printer. |

Power On Modes
With the printer power on and top cover closed, press and hold the feed button for several seconds. The green status LED will flash a number of times in sequence. The explanation at the right (Action) shows what happens when you release the key after the specific number of flashes.

Flash Sequence	Action
*	A configuration label prints.
* **	The media sensor calibrates and a media sensor profile prints (see "Manual Calibration" on page 47).
* ** ***	To reset the communication parameters: Press and release the feed button while the LED rapidly flashes yellow and green. The serial communication parameters reset to 9600 baud, 8 bits per character, no parity, 1 stop bit, and XON/XOFF. For autobaud synchronization: Send a ZPL II format to the printer while the LED rapidly flashes yellow and green. When the printer and host are synchronized, the LED changes to solid green. NOTE: No labels will print during autobaud synchronization.
* ** *** ****	Resets the factory defaults, auto calibrates, and saves settings into memory.
* ** *** **** *****	The print width calibrates. While the status LED alternately flashes green and yellow, a series of stacking rectangles print on the label. When the rectangle prints to the outer edges of the label, press and release the feed button. The label width and current communication parameters will be saved into memory.
* ** *** **** ***** ******	The print darkness calibrates. A series of nine samples print, starting with the lightest and ending with the darkest image. When the desired print darkness is achieved, press and release the feed button. The print darkness will be saved into memory.
If the feed button remains pressed after a 7-flash sequence, the printer will ignore the button when it is released.	

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Zebra R402 User's Guide