

T-462/T-443

**THERMAL TRANSFER / DIRECT THERMAL
BAR CODE PRINTER**

**USER'S
MANUAL**

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Revised Date: 8/6/2004

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1. PRODUCT INTRODUCTION

Thank you very much for purchasing TSC T-462/T-443 bar code printer. T-462/T-443 comes with rugged steel construction and durable metal mechanism ensuring the ability to work under extreme industrial applications.

T-462/T-443 is equipped with a 32-bit RISC processor, which offers up to 4"/sec print speed. With back-lit LCD display, printer status can be managed easier and operated more user friendly. The moveable sensor design can meet wide range of label media.

All of the most frequently used bar code formats are available in T-462/T-443.

Fonts and bar codes can be printed in any one of the four directions. This printer provides a choice of five different sizes of alphanumeric font, OCR-A, OCR-B and one true type font.

T-462/T-443 is the most cost-effective and high performance in its class!

1.1 Compliances

1.2 Specification

1.2.1 Printer

Item	Specification
Printing Mode	Thermal transfer and direct thermal
Resolution	203DPI(T-462), 300 DPI (T-443)
Max. Print Length	1000 mm (T-462), 420 mm (T-443)
Max. Print Width	104 mm (T-462), 108 mm (T-443)
Print Speed	3,4,5,6 ips (T-462); 2,3,4 ips (T-443)

1.2.2 Environment

Operating Environment	
Temperature	5 ~40 °C
Humidity	30 % ~ 85 %
Storage Environment	
Temperature	-10 ~ 60 °C
Humidity	20 ~ 95 %
Ventilation	Free air environment

1.2.3 Hardware

Sensors	Label gap sensor, Paper end sensor, Ribbon end sensor, Ribbon near end sensor, Black mark sensor, Head open sensor, Case open sensor, Label taken sensor, Paper near end sensor.
Memory	Flash ROM (2MB), DRAM (2MB) and 8M optional flash ROM (memory module)
Interface	RS-232C (RS422/485 option), Centronics (SPP), USBV1.1 and Internal LAN adapter (option).
Cutter	4 inch width (Paper thickness up to 0.25 mm)
Power	100-240 V universal switching power supply.
Other	Real Time Clock

1.2.4 Bar Code

Code 39, Code 39C, Code 93, Code128 subsets A.B.C, Codabar, Interleave 2 of 5, EAN-8, EAN-13, EAN-128, UPC-A, UPC-E, EAN and UPC 2(5) digits add-on, CPOST, MSI, PLESSEY, POSTNET, EAN-14, ITF-14, PDF-417, Maxicode, DataMatrix, QR code

1.3 Optional Items

- Cutter module
- Peel off sensor
- Portable LCD keyboard (KP-200, KU-007 series)
- Memory module
- Internal Ethernet print server
- External 802.11b wireless print server

1.4 Supplies

1.4.1 Label Specification

Item	Specification
Type	Roll and label (Continuous, die-cut, fan-fold, ticket, Tag etc., Tag is option)
Label Width	25.4~116 mm (1"~4.4")
Label Length	10~999 mm (0.4"~39.33")
Label Thickness	0.06~0.25 mm
Label Roll Diameter	203 mm (Max.)
Roll Core Diameter	25 or 77 mm
Black Mark Width	3 mm (Min.)

1.4.2 Ribbon Specification

Item	Specification
Ribbon Width	25.4~114.3 mm
Ribbon Length	300 m (Max.)

2. GETTING STARTED

2.1 Unpacking and Inspection

After receiving the bar code printer, carefully inspect the device and its packaging. The printer is specially packaged to withstand damage in shipping. In case of evident damage, contact the carrier directly to specify the nature and extent of damage. Please retain the packaging materials in case you need to reship the printer.

2.2 Equipment Checklist

- T-462/T-443 printer unit
- Ribbon paper core
- Quick installation guide
- Power cord
- Centronics interface cable
- 3" paper core adapter
- Software CD disc

Separately purchased items may also be included. These additional items may include:

- Cutter module
- Peel off sensor
- Portable LCD keyboard (KP-200, KU-007 series)
- Memory module
- Internal Ethernet print server
- External 802.11b wireless print server

If any part is missing, please contact the Customer Service Department of your purchased reseller or distributor.

2.3 Printer Parts



Figure 1. Printer front view



Figure 2. Printer rear view

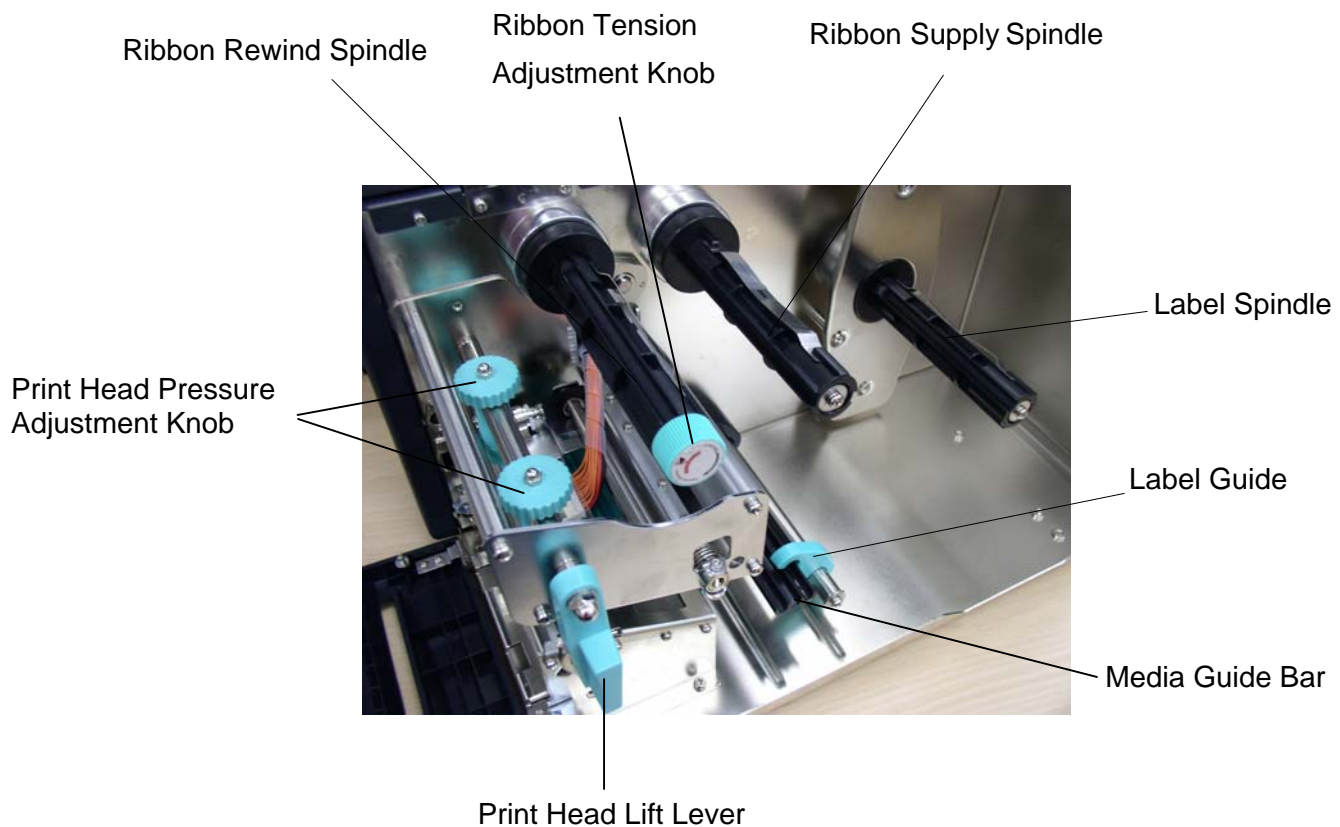


Figure 3. Printer interior view

2.4 Buttons, Indicators and adjustment knobs

Power Indicator

When the printer is in the power-on condition, the **Power** indicator is lit on.

On-Line Indicator

This green **On-Line** indicator is lit on when the printer is ready; the **On-Line** indicator blinks when pressing **PAUSE** button.

Error Indicator

The red **Error** indicator illuminates in the event of a printer error, such as memory full, carriage open, cutter error and so forth.

MENU/SELECT Button

Provided with a built-in menu, the printer allows the user to directly set printing parameters or view printer status on the LCD display.

Press the **MENU** button to enter printer setup mode. Press the **MENU** button again to proceed the cursor to the next item.

The setup is comprised of these major items: Printer Setup, Sensor Setup, System Setup, File Setup and Printer Test. For more information, please refer to Appendix for the structure and operation logic of the menu.

PAUSE/EXE/INC Button

This button combines three functions:

A. **PAUSE** button if the printer is in the Ready status. By pressing the **PAUSE**

button: (1) the printer stops at the completion of printing of the current label,(2) the **On-Line** LED flashes, and (3) the printer holds all data in memory. This allows for trouble-free replacement of label stock and thermal transfer ribbon. A second depression of the **PAUSE** button will restart the printer.

B. **EXE/INC** button if in the setup mode. Press **EXE/INC** button to increase the value of parameters, or execute the selected item.

FEED/DEC Button

This button also has dual functions: Feed one label and decrease the value of parameters.

Press the **FEED** button, the printer will advance one label.

Press the **DEC** button to change parameter settings or exit the submenu.

Print Head Lift Lever

When opening the **Print Head Lift Lever**, **On-Line** LED is lit off, the LCD display shows "Carriage Open". After engage the print head lift lever, press the **FEED** button, printer will re-register the label and then shows READY on the LCD display, and the screen will return to ready condition.

Ribbon Tension Adjustment Knob

The **ribbon tension adjustment knob** offers 6 levels of tension to adjust for different widths of ribbon. Turn the ribbon tension knob clockwise and you will hear a light click sound as the gear changes. The level of rewind ribbon is from loose to tight, level 0 to level 5. You will hear a louder click for level 1.

Print head Pressure Adjustment Knob

The **print head adjustment knobs** are used to fine tune print quality for

different thickness of media. Turning the knobs adjusts the print head's burn line forward or backward as it relates to the platen roller.

Print head burn line adjustment knob

The **print head adjustment knobs** are used to fine tune print quality for different thickness of media. Turning the knobs adjusts the print head's burn line forward or backward as it relates to the platen roller.

Caution: incorrectly adjusting these knobs can lead to poor print quality and may cause damage to the printer. Proceed with caution.

The print head burn line default is set for general purpose printing media (plain paper and paper thickness less than 0.20mm). The adjustment knobs default is screwed to the end of thread.

Poor print quality when using paper thicker than 0.20mm may be due to the print head burn line not being at the optimized position. To correct this, increase the head pressure and adjust the knobs counter-clockwise to move print head burn line forward then print again. Continue to adjust and test print as necessary until the image is clear.

Note: The print head moves 0.7 mm for each 360 degree turn.

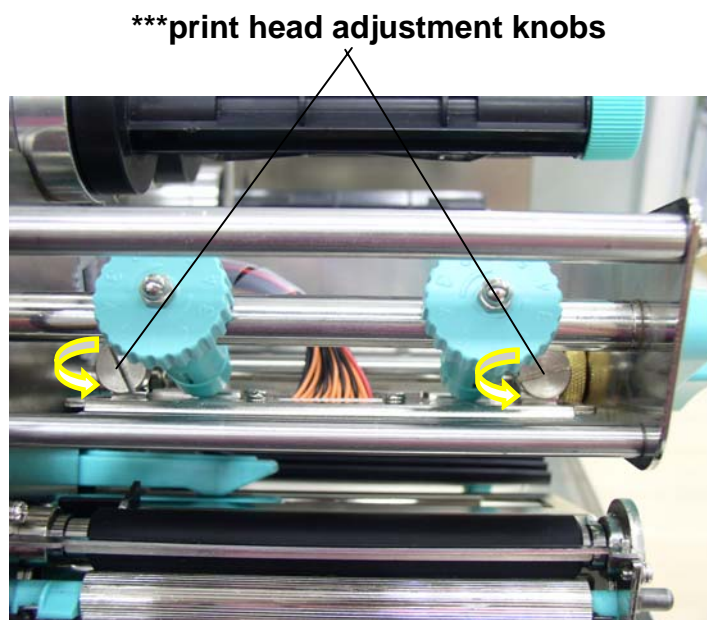


Figure 4. Print head adjustment knobs

3. Set Up

3.1 Setting Up the Printer

1. Place the printer on a flat, secure surface.
2. Make sure the POWER switch is off.
3. Connect the printer to the computer with the provided RS-232C or Centronics cable.
4. Plug the power cord into the power supply connector at the rear of the printer, and then plug the power cord into a properly grounded power outlet.

3.2 Ribbon Installation

1. Open printer right side cover and lower front panel.
2. Disengage print head lift lever.
3. Install a new ribbon spindle onto the ribbon supply spindle.

Notice : Ribbon should be placed to the left end of spindle.



Figure 5. Ribbon supply spindle installation

4. Place an empty paper core onto the ribbon rewind spindle. (The diameter of empty paper core must be larger than 34 mm)
5. Pull the ribbon roll leading edge forward through the ribbon sensor, and attach the ribbon leading edge (with a tape) to the empty paper core.
6. Manually rotate the ribbon rewind roll until the ribbon is properly stretched.

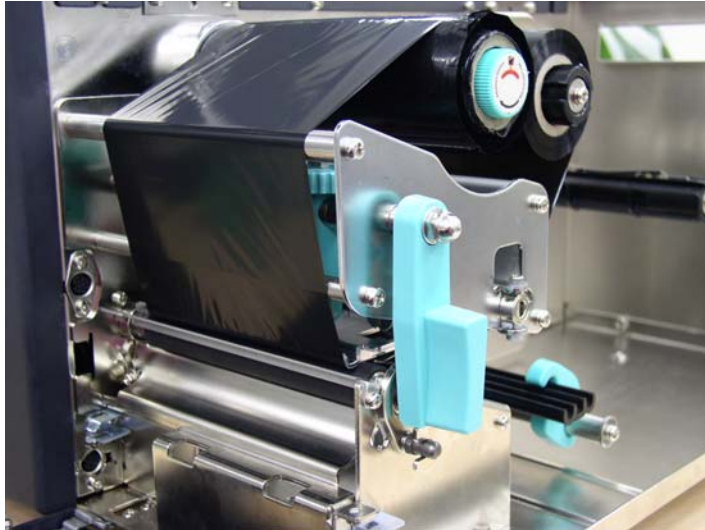


Figure 6. Installation of thermal transfer ribbon

3.3 Label Roll Installation

1. Insert a new label roll into the label spindle.
2. Pull label roll leading edge forward through the black media guide bar, gap/black mark sensor and place the label leading edge onto the platen roller.
3. Adjust the label guide to meet the width of the label, and buckle it onto the black media guide bar.
4. Engage the print head lift lever.
5. Close the lower front panel and printer cover.
6. Switch on the power. Now, the printer is ready to print.

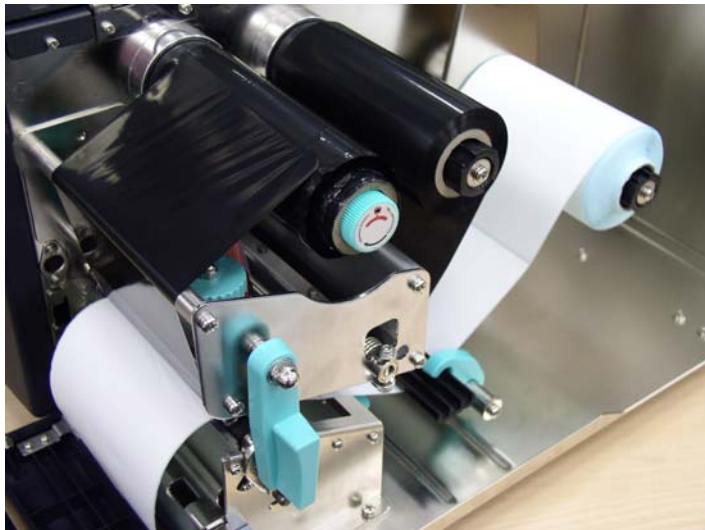


Figure 7. Insert a label roll into label spindle.

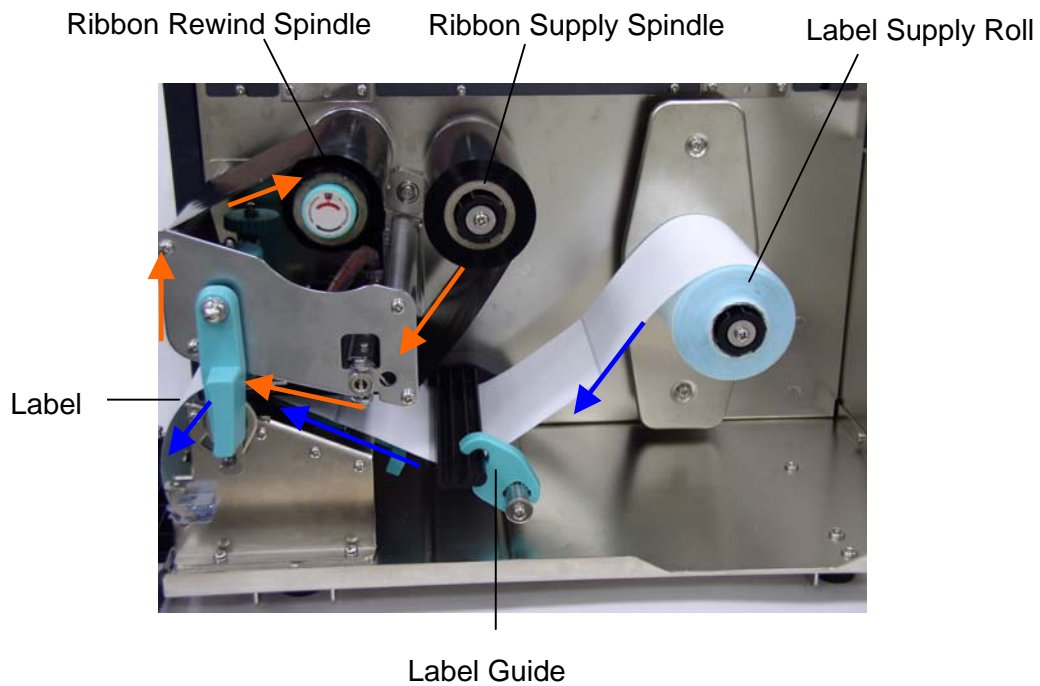


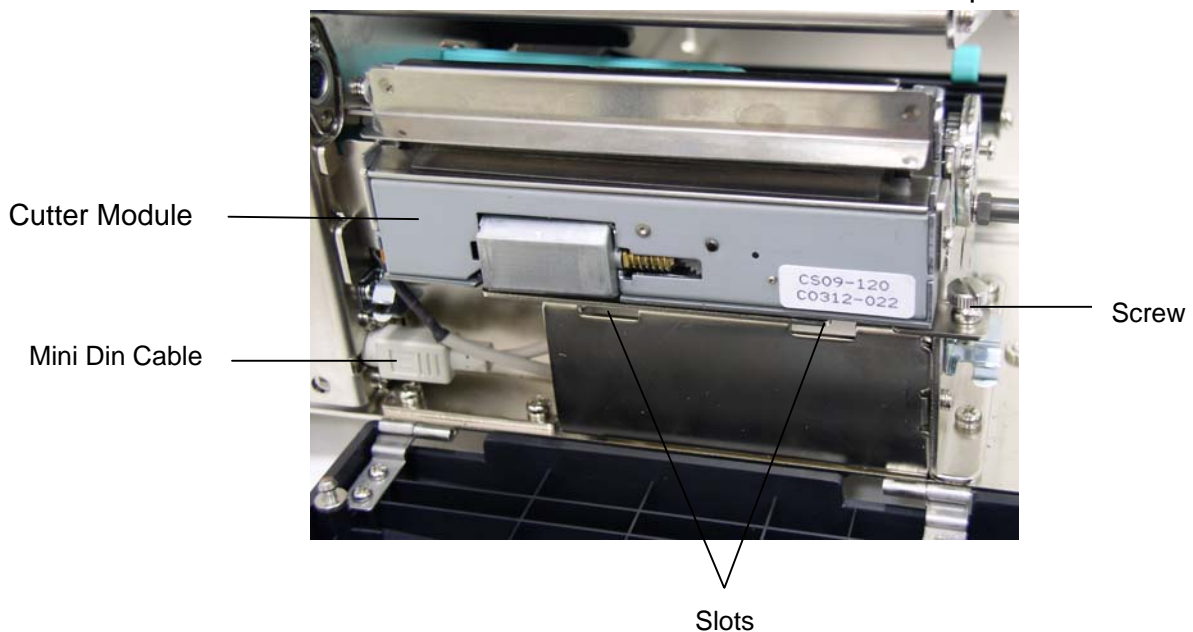
Figure 8. Ribbon & label installation path

3.4 Cutter Module Installation (Option)

1. Remove the 2 screws of the peel-off panel and uninstall the peel-off panel if it is installed in the front panel.
2. Plug the mini DIN cable into the socket of the cutter connector.
3. Install the cutter module.

Notice : The cutter module bracket should be mounted into the slots.

4. Fix the cutter module onto the printer cutter mount with a screw.
5. Install the Cutter Module Panel with 2 screws to the front panel.



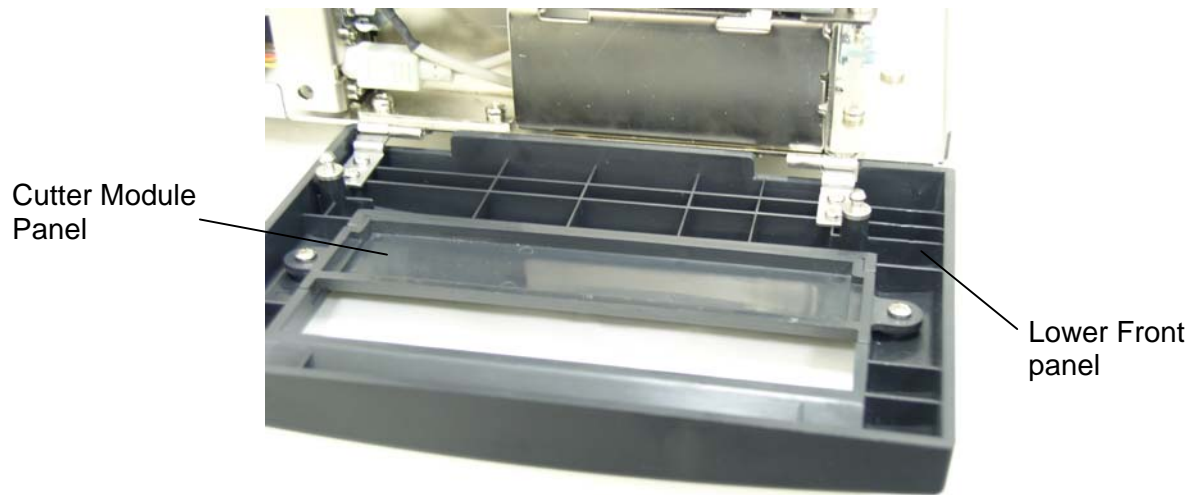
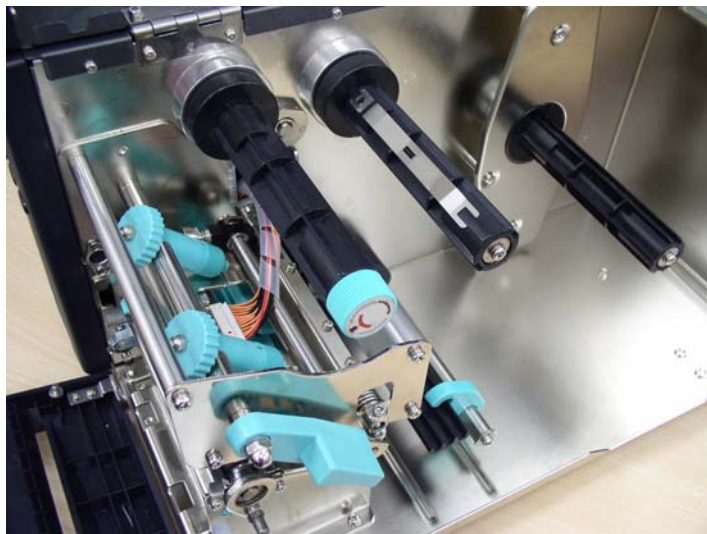


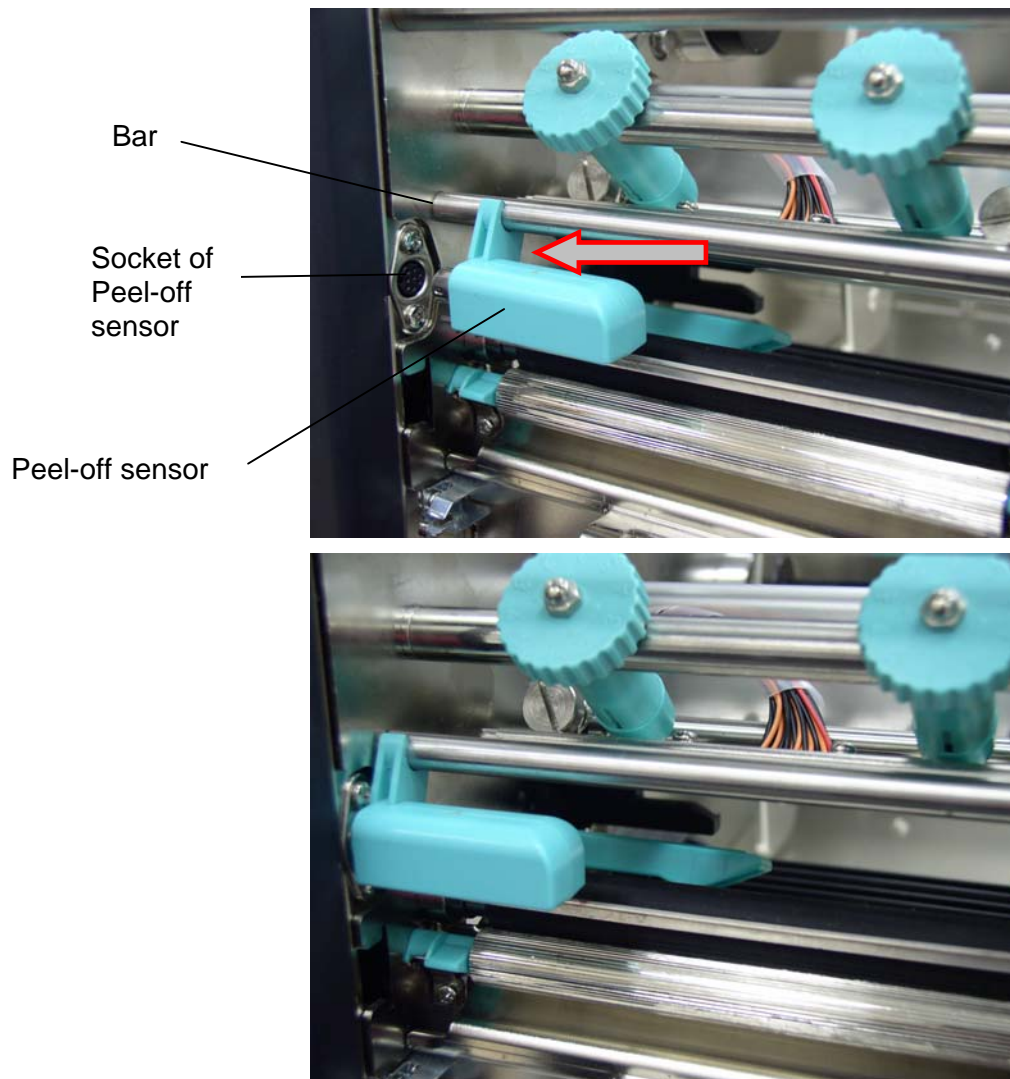
Figure 9. Cutter module installation

3.5 Peel-off Sensor Installation (Option)

1. Open the lower front panel and the printer right side cover.



2. Hook the peel-off sensor on the bar that is under the print head pressure adjustment knobs horizontally. Plug the Peel-off sensor to the socket on the left side.



3. Close the lower front panel.

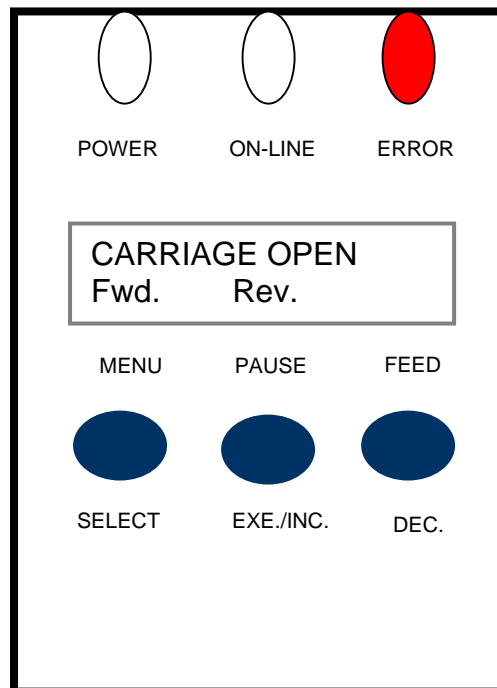


3.6 Loading Label For Peel-off Mode

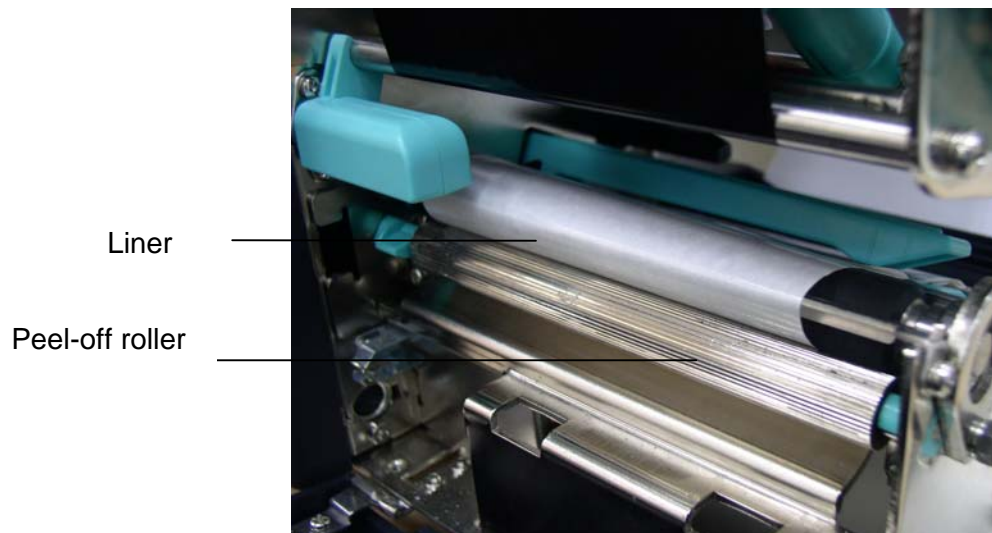
1. Open the **Print Head Lift Lever**. The message “CARRIAGE OPEN” will be shown on the LCD screen, and the RED LED is on. The LCD panel shown as below.



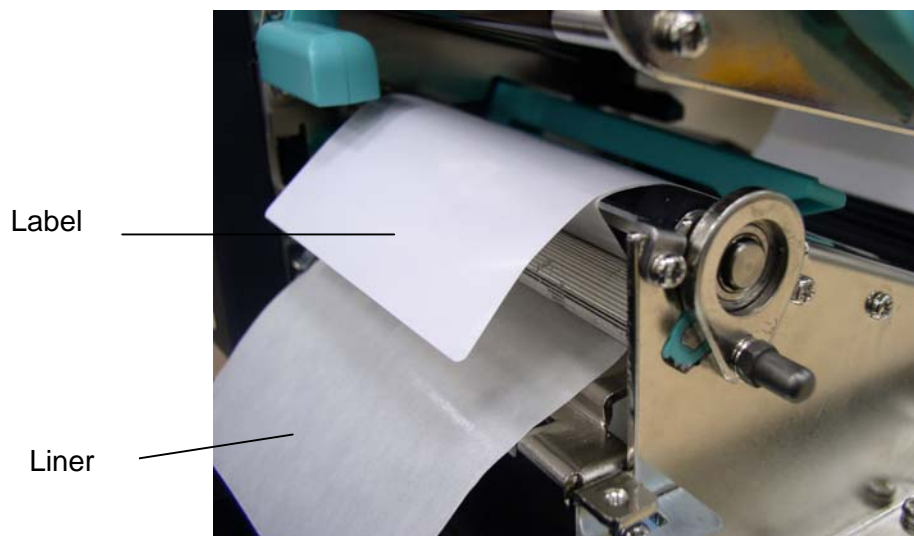
Print Head Lift Lever



2. Remove the first one label from the liner. Insert the liner into the gap between **Platen** and **Peel-off roller**.



3. Press the button (**MENU, SELECT**) under the message “Fwd.” to feed the label forward a little bit. Press the button (**PAUSE, EXE./INC.**) under the message “Rev.” to reverse the label if it is necessary for adjusting the label. Pull the liner outward tightly. Close the Print Head Lift Lever.



4. Close the lower front panel. Pull the label through the Peel-off panel upper opening; pull the liner through the Peel-off panel upper opening.



3.7 Self-test

To initiate the self-test mode, depress the **MENU** button. Press MENU button to scroll the cursor to Printer test. Press EXE button to enter the submenu and press MENU button to “Printer Config”. item. Press EXE button to print printer internal setting. In self-test, a check pattern is used to check the performance of the thermal print head. Following the check pattern, the printer prints internal settings as listed below:

1. Firmware version
2. Check sum
3. Serial port setting
4. Code page setting
5. Country code setting
6. Print speed setting
7. Print density setting
8. Label size setting
9. Gap (Bline) width and offset setting
10. Backing paper transparence
11. File list
12. Memory available

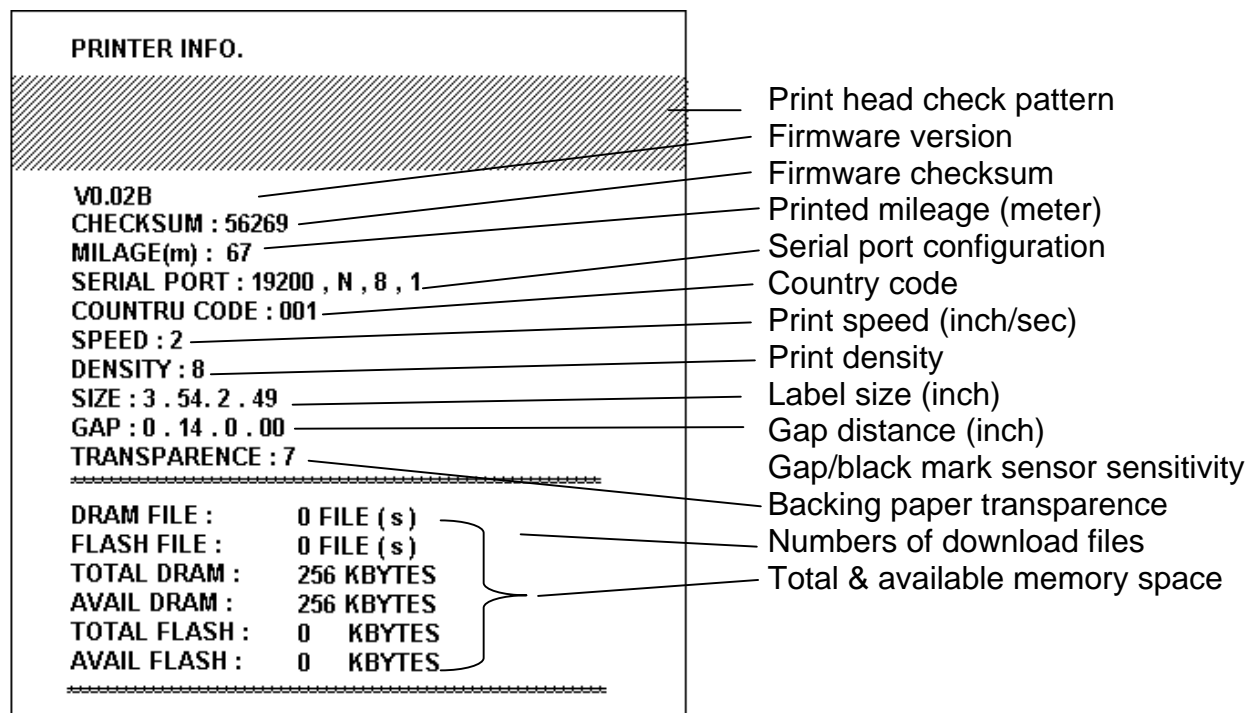


Figure 10. Printout of self-test

3.8 Dump Mode

To enter dump mode, press MENU button to scroll the cursor to “Printer Test” then press EXE button to enter the submenu. Press MENU button to scroll dump mode. Press EXE button to select line dump mode or page dump mode. Press MENU button to select EXIT to enter dump mode. In this mode, any character sent from the host computer will be printed in two columns, as shown in Figure 10.

The characters received will be printed in two columns as below.

On the left side of the paper are the characters received, and on the right side are the corresponding hexadecimal values. This is very helpful to users for the verification of programming commands or debugging of printer programs. Reset the printer by pressing the FEED button.

SPEED 2.0	53 50 45 45 44 20 32 2E 30 0D
DENSITY 8	0A 44 45 4E 53 49 54 59 20 38
SET PEEL	0D 0A 53 45 54 20 50 45 45 4C
OFF DIRE	20 4F 46 46 0D 0A 44 49 52 45
CTION 0 G	43 54 49 4F 4E 20 30 0D 0A 47
AP 3.00 mm	41 50 20 33 2E 30 30 20 6D 6D
.0.00 mm	2C 30 2E 30 30 20 6D 6D 0D 0A
REFERENCE	52 45 46 45 52 45 4E 43 45 20
0.0 SET C	30 2C 30 0D 0A 53 45 54 20 43
UTTER OFF	55 54 54 45 52 20 4F 46 46 0D
SIZE 100.	0A 53 49 5A 45 20 31 30 30 2E
02 mm, 65.0	30 32 20 6D 6D 2C 36 35 2E 30
4 mm CLS	34 20 6D 6D 0D 0A 43 4C 53 0D
BARCODE 1	0A 42 41 52 43 4F 44 45 20 31
44.149, "39	34 34 2C 31 34 39 2C 22 33 39
", 120.1, 0.	22 2C 31 32 30 2C 31 2C 30 2C
2.6, "57114	32 2C 36 2C 22 35 37 31 31 34
38T" PRIN	33 38 54 22 0D 0A 50 52 49 4E
T 1.1 SPE	54 20 31 2C 31 0D 0A 53 50 45
ED 2.0 DE	45 44 20 32 2E 30 0D 0A 44 45
NSITY 8 S	4E 53 49 54 59 20 38 0D 0A 53
ET PEEL OF	45 54 20 50 45 45 4C 20 4F 46
F DIRECTI	46 0D 0A 44 49 52 45 43 54 49
ON 0 GAP	4F 4E 20 30 0D 0A 47 41 50 20
3.00 mm, 0.	33 2E 30 30 20 6D 6D 2C 30 2E
00 mm REF	30 30 20 6D 6D 0D 0A 52 45 46
ERENCE 0.0	45 52 45 4E 43 45 20 30 2C 30
SET CUTT	0D 0A 53 45 54 20 43 55 54 54
ER OFF SI	45 52 20 4F 46 46 0D 0A 53 49
ZE 100.02	5A 45 20 31 30 30 2E 30 32 20
mm, 65.04 m	6D 6D 2C 36 35 2E 30 34 20 6D
m CLS BA	6D 0D 0A 43 4C 53 0D 0A 42 41
RCODE 144.	52 43 4F 44 45 20 31 34 34 2C
149, "39", 1	31 34 39 2C 22 33 39 22 2C 31
20.1, 0.2, 6	32 30 2C 31 2C 30 2C 32 2C 36
, "5711438T	2C 22 35 37 31 31 34 33 38 54
" PRINT 1	22 0D 0A 50 52 49 4E 54 20 31
, 1	2C 31 0D 0A

ASCII Data →

Hex decimal data related to left column of ASCII data →

Figure 11. Printout of dump mode

4. USING T-462/T-443

4.1 Power-on Utilities

There are two power-on utilities to calibrate sensor and initialize T-462/T-443 hardware. These utilities are activated by pressing the PAUSE button, PAUSE and FEED buttons and turning on the printer power simultaneously. The utilities are listed as below :

1. Gap/black mark sensor calibration
2. Printer initialization

4.1.1 Gap/Black Mark Sensor Calibration Utility

This utility is used to calibrate the sensitivity of the gap/black mark sensor. The gap/black mark sensor must be calibrated whenever **changing the label media** or **executing printer initialization**.

Please follow the steps below to calibrate the gap sensor.

1. Install the ribbon and label roll as the above-mentioned procedures, and engage the print head lift lever.
2. Turn off printer power.
3. Press **PAUSE** key and then turning on printer power. Release the **PAUSE** key when "GAP/BLINE sensor calibrating...." Message is shown on the LCD display. The printer will calibrate the gap/black mark sensor automatically.

4.1.2 Printer Initialization

Printer Initialization will restore printer settings to defaults.
Default settings are listed as below.

Item	Default Value	Cleared by Initialization	Property Saved when Turning off Power
Mileage	N/A	No	Yes
Check Sum	N/A	No	Yes
Serial Port	9600,n,8,1	Yes	Yes
Code Page	437	Yes	Yes
Country Code	001	Yes	Yes
Tear Mode	On	Yes	Yes
Peel Mode	Off	Yes	Yes
Cutter Mode	Off	Yes	Yes
Offset	0	Yes	Yes
Reference Point	0,0	Yes	Yes
Print Direction	1	Yes	Yes
Speed	4 inch/sec	Yes	Yes
Density	07	Yes	Yes
Label Size	4 x 2.5"	Yes	Yes
Gap/Blind Sensor	Gap Sensor	Yes	Yes
Gap(Blind)	0.12" (3 mm)	Yes	Yes
Transparency	142	Yes	Yes
Ribbon Sensor Sensitivity	1	Yes	Yes
LCD Language	English	Yes	Yes
Aux. LED	Off	Yes	Yes
Aux. Buzzer	Off	Yes	Yes
Download Files	N/A	No	Yes
RTC	N/A	No	No

Please follow the steps below to initialize the printer:

1. Turn off the printer power.
2. Hold down the **PAUSE** and **FEED** buttons and turn on the printer power.
3. Do not release the buttons until the Red LED flash in turn.

Note¹: Printing method (thermal transfer or thermal direct printing) will be set automatically at the activation of printer power.

Note²: When printer initialization is done, please calibrate the gap sensor again.

4.2 Troubleshooting Guide

The following guide lists the most common problems that may be encountered when operating this bar code printer. If the printer still does not function after all suggested solutions have been invoked, please contact the Customer Service Department of your purchased reseller or distributor for assistance

Phenomenon	Reasons	Solutions
No ribbon	<ol style="list-style-type: none">1. Running out of ribbon2. The ribbon is installed incorrectly.3. The ribbon sensor is not been well calibrated.	<ol style="list-style-type: none">1. Supply a new ribbon roll.2. Please refer to the steps in section 3.2 Ribbon Installation to reinstall the ribbon.3. Please calibrate the ribbon sensor
No paper	<ol style="list-style-type: none">1. Running out of label2. The label is installed incorrectly.3. The moveable gap/black mark sensor is not placed in the proper location.	<ol style="list-style-type: none">1. Supply a new label roll.2. Please refer to the steps in section 3.3 Label Roll Installation to reinstall the label roll.3. Please move the sensor to the proper location.
Poor printing quality	<ol style="list-style-type: none">1. Dirt is accumulated on the print head.2. The density setting is not set properly3. Ribbon and media are incompatible.4. The pressure of print head is not set properly	<ol style="list-style-type: none">1. Please refer to the steps in the section 5.1 Print Head Cleaning to clear the print head.2. Adjust the print density and speed.3. Change proper ribbon or proper label roll.4. Adjust the print head pressure adjustment knob.
Power indicator does not illuminate	<ol style="list-style-type: none">1. The power cord is not properly connected.2. The voltage setting of power supply in the rear of printer is set incorrectly.	<ol style="list-style-type: none">1. Please check whether the power cord is well connected between printer and outlet.2. Please set the voltage setting of power supply at the rear of printer to the proper voltage.
Paper jam	<ol style="list-style-type: none">1. The label size is not set properly.2. Labels may be stuck in side print mechanism.	<ol style="list-style-type: none">1. a. Reset the label size. b. Re-calibrate the gap/black mark sensor.2. Remove the stuck label.
Carriage open	The printer carriage is open.	Please close the print carriage.

Memory full (FLASH / DRAM)	The space of FLASH/DRAM is full.	Delete unused files in the FLASH/DRAM. Maximum 50 files saved in DRAM. Maximum 100 files saved in Flash Files.
No printout printing through serial port	<ol style="list-style-type: none"> 1. The serial port setting is not consistent between host and printer. 2. The serial port cable pin configuration is not pin to pin assignment. 	<ol style="list-style-type: none"> 1. Please reset the serial port setting. 2. Please replace the cable with pin to pin assignment.

5. PRINTER CLEANING

The printer should be cleaned regularly to retain high quality and optimum performance.

5.1 Print Head Cleaning

1. Switch off and unplug the printer.
2. Open the printer cover.
3. Remove the screw by the side of the print head lift lever.
4. Open the printer print head lift lever.
5. Remove the media and ribbon. (If loaded)
6. Using a swab soaked in the dilute alcohol, wipe along the print head carefully.
7. Do not close the print head until the alcohol volatilizing.
8. Close the printer cover.

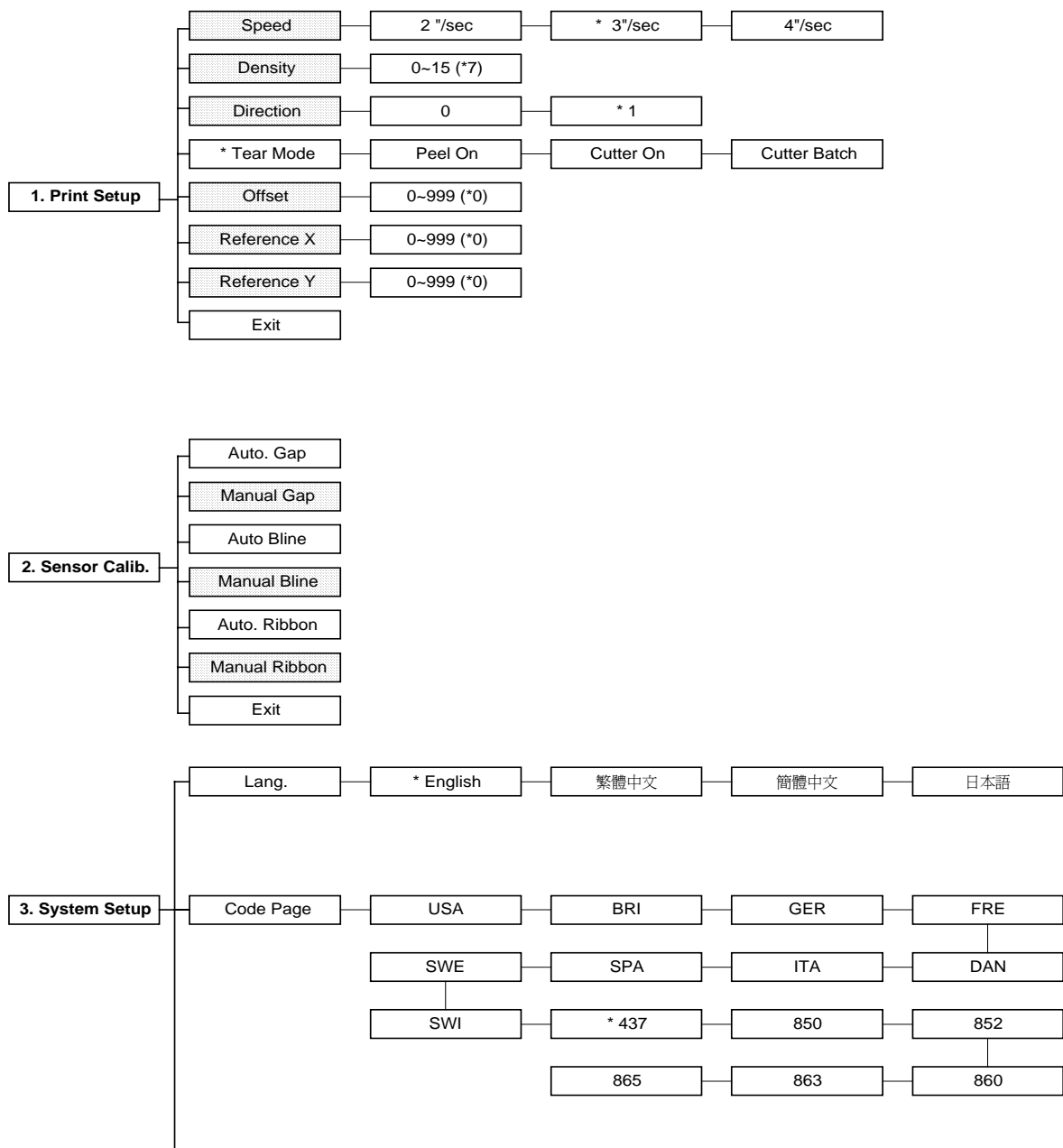
5.2 Printer Cover Cleaning

1. Switch off and unplug the printer.
 2. Using a lint-free cloth soaked in the water or mild detergent, wipe the printer cover light.
- ※ **Do not use harsh or abrasive cloth and solvent.**

5.3 Internal Parts Cleaning

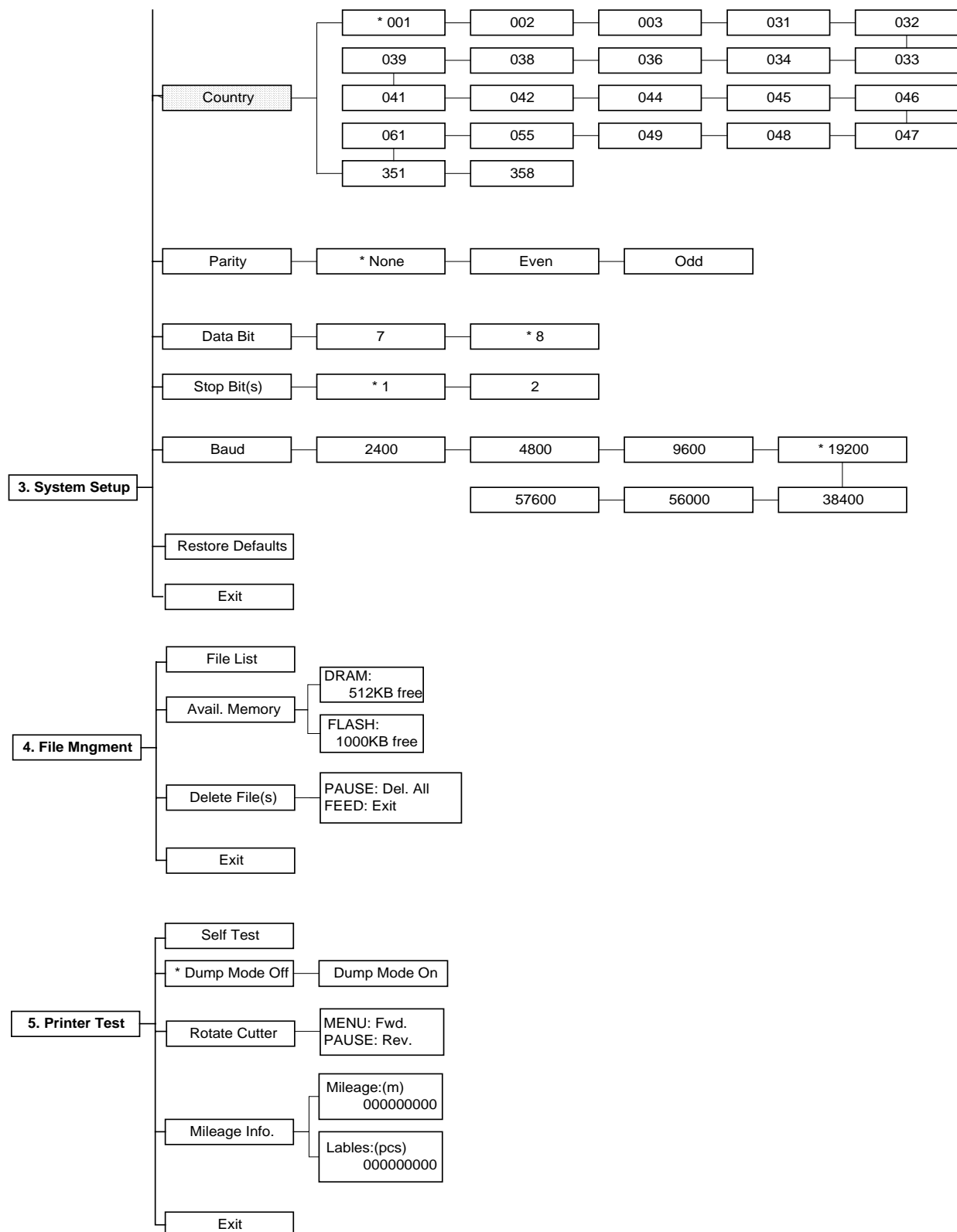
1. Switch off and unplug the printer.
2. Open the printer right side cover.
3. Remove the media and ribbon (If loaded).
4. Open the printer print head lift lever.
5. Using a soft cloth soaked in the alcohol or mild detergent to wipe the internal parts.
6. The rubber roller should be clean by cloth soaked in water.
7. Install the ribbon and label, close the print head lift lever.
8. Close the printer right side cover.

APPENDIX LCD Control Panel Operation Map



Note:

1. Defaults are marked with asterisk (*)
2. The parameter of shaded area can be accessed by pressing the INC. or DEC. key to set the value.



Revise History

Date	Content	Editor
2003/9/11	<ol style="list-style-type: none"> 1. Remove Spindle Support Frame 2. Add Ribbon Tension Knob and description 3. Add Print Head Pressure Adjustment Knob description 	Zoe Yeh
2004/2/19	<ol style="list-style-type: none"> 1. Add 4.3 Print head adjustment knobs Operating Instruction 	Michelle Su
2004/5/30	<ol style="list-style-type: none"> 1. Remove the spindle support plate & plunk on ribbon and label installation procedure. 2. Correct the maximum label thickness. 3. Enhance the illustration for self-test and dump mode printout 	Phil Liu
2004/06/02	<ol style="list-style-type: none"> 1. Add 3.5, 3.6 Peel-off Sensor Installtion and Loading label for Peel-off mode. 2. Modify 2.4 Buttons, Indicators and adjustment knobs. 	Michelle Su
2004/06/04	<ol style="list-style-type: none"> 1. RS-232 baud rate is set to 9600 bps after printer initialization 	Phil Liu
2004/07/30	<ol style="list-style-type: none"> 1. Modify 4.1.2 Printer Initialization. The steps to initialize the printer. 	Michelle Su
2004/08/06	<ol style="list-style-type: none"> 1. Modify 3.6 Loading label for peel-off mode. 	Michelle Su

