



Ovation™2 Operator's Manual

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Part Number: 88-2185-01

Revision: B2

Agency Compliance and Approvals:

FCC: This device complies with Part 15 of FCC rules.

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 instructions in this manual, it 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.

Important Safety Instructions

This printer has been carefully designed to give you many years of safe, reliable performance. As with all electrical equipment, there are a few basic precautions you should take to avoid hurting yourself or damaging the printer:

- Carefully read the installation and operating instructions provided with your printer.
- Read and follow all warning instruction labels on the printer.
- Place the printer on a flat, firm, solid surface.
- To protect your printer from overheating, make sure all openings on the printer are not blocked.
- Do not place the printer on or near a heat source.
- Do not use your printer near water, or spill liquid into it.
- Be certain that your power source matches the rating listed on your printer. If you are unsure, check with your dealer or with your local power company.
- Do not place the power cord where it will be walked on. If the power cord becomes damaged or frayed replace it immediately.
- Do not insert anything into the ventilation slots or openings on the printer.
- Only qualified, trained service technicians should attempt to repair your printer.

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Getting Started

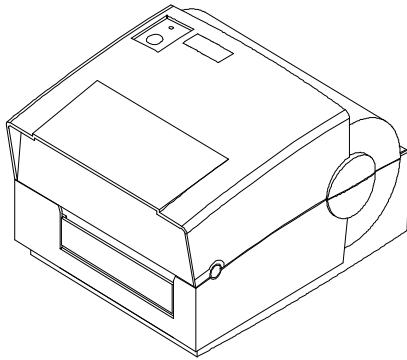


Figure 1-1 Printer Overview

1.0 Introduction

The Ovation™2 hereafter referred to as ‘the printer’, is a high quality/low cost direct thermal and optional thermal-transfer label printer. The printer’s unique construction combines a durable plastic casing with a metal print mechanism to ensure reliability and consistent print registration. The combination of powerful capabilities, compact design, easy-to-use features, and affordable pricing set a new standard for direct thermal and thermal-transfer label printers.

This manual provides all the information necessary to operate your printer. To print labels, tags, or tickets refer to the instructions included with the software you are using to create the labels.

1.1 Unpacking and Inspection

Inspect the shipping container(s) for damage, if damage is evident notify the shipping company to specify the nature and extent of the damage.

Remove the printer from the packaging material and check the contents of the package. In addition to this manual the following items should be included:

- Label printer
- External power supply
- Special or additional items purchased.

<p>Note: It is a good idea to save the carton and packaging materials in the event shipping the printer is required.</p>

1.2 Additional Requirements

The following items are necessary to generate labels with your printer. It may be a good idea to contact your local reseller for advice on which media and software is best suited for your needs.

- Serial or parallel cable, (see Section 1.4)
- Power cord for 230 VAC operation only, (120 VAC units come with a power cord).
- Applicable media
- Applicable software

1.3 Connecting Power

The printer is powered from an external power supply that connects to the printer as shown below. Power supplies are available in both 115 and 230 AC voltages. Ensure that the power supply shipped with your printer matches your electrical service.

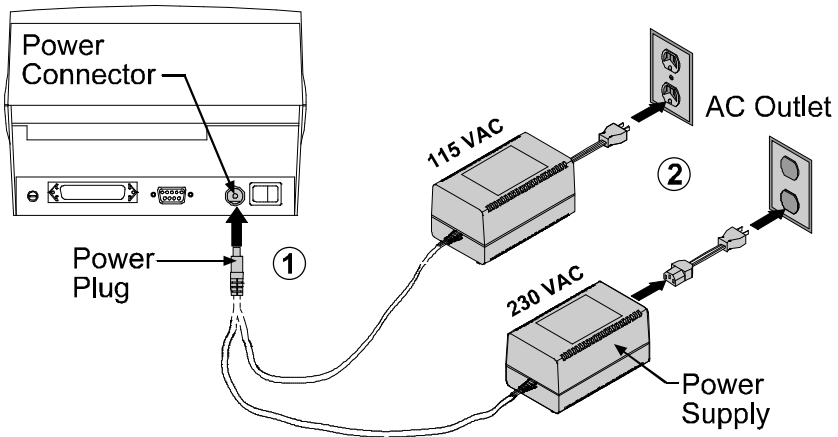
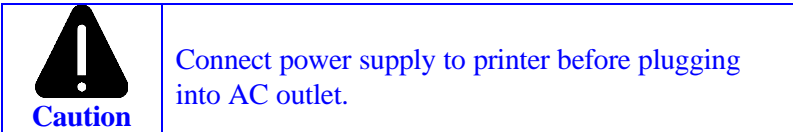


Figure 1-2 Connecting power to the Printer

1.4 Interfacing to the Printer

The printer can be connected to the host via a **serial** or **parallel** cable.

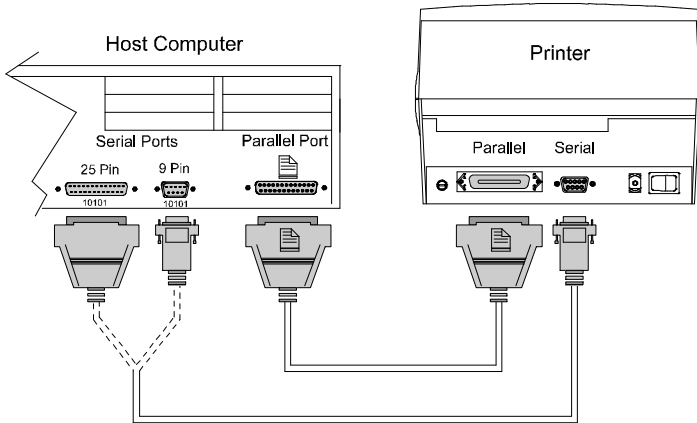


Figure 1-3 Interfacing to the Printer

1.5 Interface Cables

An interface cable is necessary to connect the printer to the host. The interface between the printer and the host will be either a serial RS-232C or parallel cable. Cable configurations for serial (RS-232C) interfaces are shown below, (contact your reseller for part numbers and ordering information).

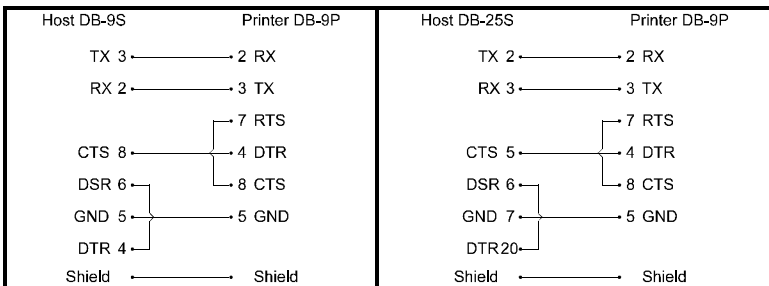


Figure 1-4 Serial Cables

The printer can also be connected to the host with a parallel connection. In addition, the printer has a unique feature where if you connect both the serial and parallel cables to the printer at the same time, the printer will automatically interface to the first connection, (serial or parallel) that transmits valid data. After a connection has been made, the printer must be turned off and then back on again to change the interface connection.

1.6 Loading Media

1. Open the cover.
2. Push the printhead latch toward the back of the printer and raise the printhead carrier assembly.
3. Place a roll of media (labels facing up) on the media hub and insert them into the printer. Slide the media hub against the roll of media
4. Pull 6" (152 mm) of media from the media roll in the printer.
5. Slide the media guide to the edge of the media.
6. Close the printhead carrier assembly and press down until it locks into place.

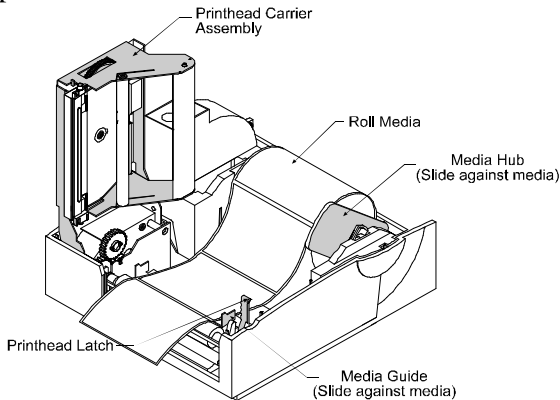


Figure 1-5 Loading Media

7. Close the cover and press the 'Feed' Button several times to feed the media and ensure proper tracking.

Note: The printer is factory set for 4-inch media and ribbon, when using different width media/ribbon please refer to Section 1.9.

1.7 Loading Media for Peel Configuration

1. Open the cover.
2. Push the printhead latch toward the back of the printer and raise the printhead carrier assembly.
3. Place a roll of media (labels should be facing up) on the media hub and insert into the printer.
4. Pull the Peel-off Lever forward to the 'open' position.
5. Remove 6" (152 mm) of labels from the backing. Route the backing over the tearbar and behind the peel-off shaft as shown below.

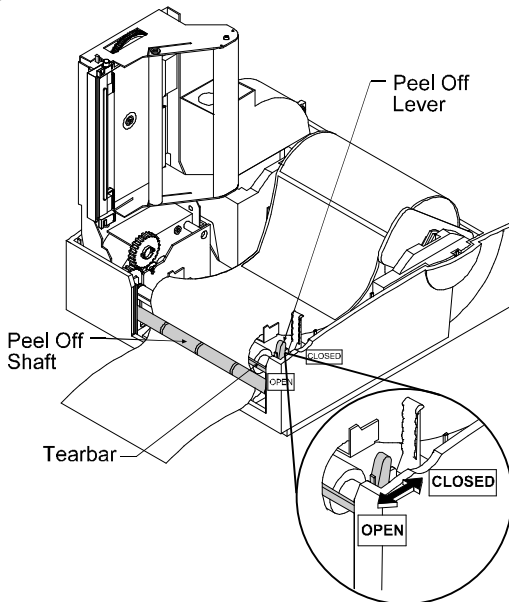


Figure 1-6 Loading Media for Peel Configuration

6. Push the Peel-off Lever back to the 'closed' position
7. Close the printhead carrier assembly and press down until it locks into place.
8. Close the cover and press the 'feed' button two or three times to feed the media and ensure proper tracking. The labels will separate automatically as it is feed through the printer.

1.8 Loading Ribbon (Thermal Transfer Option)

1. Open the cover.
2. Remove the two ribbon hubs.
3. Slide the ribbon and empty core onto the hubs making sure that the ribbon unwinds and rewinds.

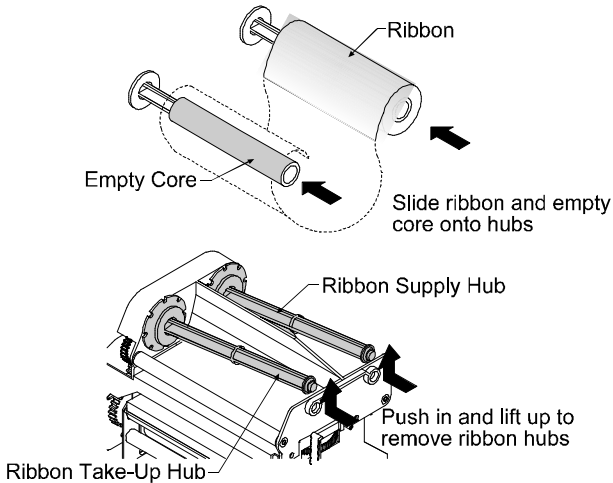


Figure 1-7 Ribbon Hub Removal

4. Place the ribbon supply hub back into the thermal transfer assembly.
5. Slide the direct/thermal transfer switch to the 'transfer' position.

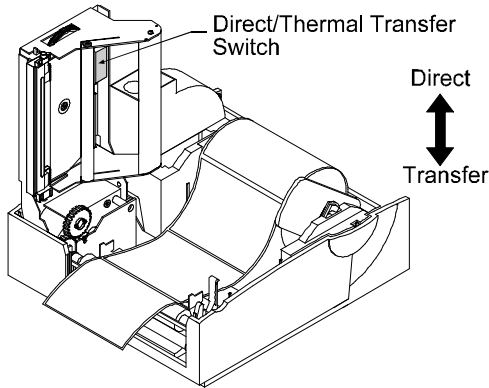


Figure 1-8 Selecting the Print Type

6. Load the printer with media (see Section 1.6) and ribbon. When loading ribbon be sure to guide the ribbon through the printhead carrier assembly as shown below.

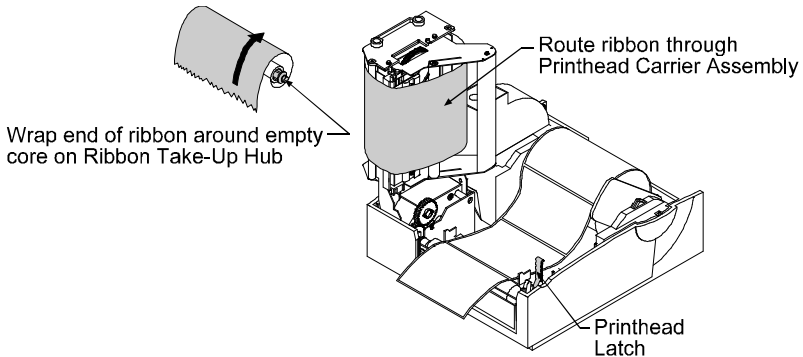


Figure 1-9 Routing the Ribbon

7. Close the cover. Press and hold the feed button down while powering on the printer. Continue to hold down the feed button until the printer starts to move the media, then release. The printer will now print a configuration label that confirms the thermal-transfer mode is set.
8. After printing a configuration label you must cycle power. To cycle power simply turn the printer off for 30 seconds, and then back on. The printer will remain set for thermal-transfer mode.

Note: The thermal-transfer mode can also be set with the configuration command <STX KD>, see Section 2.3.

1.9 Adjustments for Various Sizes of Ribbon or Media

1.9.1 Ribbon Width Adjustment

The adjustable ribbon handler feature allows adjustment to the ribbon supply hub which provides optimum tension when using different widths of media or ribbon.

1. Turn 'off' the printer.
2. Hold the ribbon supply spindle and rotate the ribbon tension adjustment knob to meet your media/ribbon widths based on the table below. Ensure that the ribbon tension adjustment knob is turned fully to the clockwise or counter-clockwise position, the knob will no longer turn once it is in the proper position, do not force or over turn.

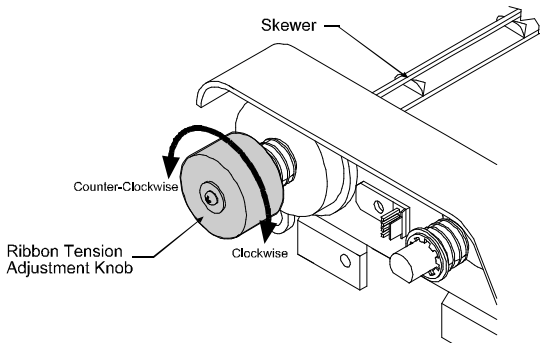


Figure 1-10 Adjusting for Media

Ribbon Size	Ribbon Width	Direction of Rotation
Narrow	1-2 inches wide	Clockwise*
Wide	2-4 inches wide	Counter-Clockwise*

* Continue turning the ribbon tension adjustment knob until it will not turn any further in either the clockwise or counter-clockwise position.

1.9.2 Media Width Adjustment

The thumbwheel on the side of the printhead carrier assembly allows the printhead to be adjusted for various sizes of media. The numbers on the thumbwheel serve only as a reference point and do not correspond with a particular media width.

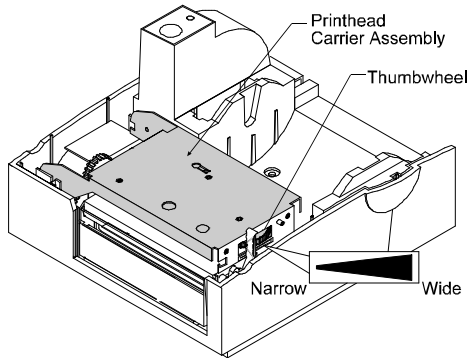
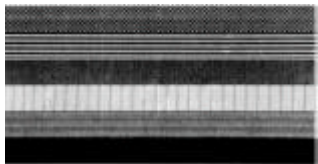


Figure 1-11 Thumbwheel for Media Width Adjustment

1. Load media into the printer.
2. Print a label, if it is light on the right-hand side then move the thumbwheel to the right, (see example below).
3. An internal test label can be generated by holding the 'feed' button down and turning 'on' the power switch until the media moves. The first label printed is the configuration label which provides information on the printer set-up. The second label printed is the test pattern and shows print quality, (see Section 1.10 for additional information).

Rotate thumbwheel clockwise until print quality along edge starts to lighten.



(Light print on the right side of the test label indicates that the thumbwheel should be adjusted clockwise.)

1.10 Power-up Configuration and Self-Test

With the printer off, load the die-cut media (the media must be at least 4 inches wide), and ribbon (if printing in thermal-transfer). Press and hold the feed button and turn the printer on, (the power LED should be 'on'), continue holding the feed button until the media begins to move then release it. The printer will automatically detect if a ribbon has been installed and will then print two test labels.

Note: After performing a power-up and self-test, the printer will be in the 'character dump mode'. Turn the printer 'off' for approximately 25 seconds, then back 'on' to restore normal operation. The printer must remain 'off' for 25 seconds in order for the main board to properly reboot.

The first label printed will be the configuration label, which lists the printer's configuration and status. Note that this configuration label shown below was printed from a printer that had the time/date option installed.

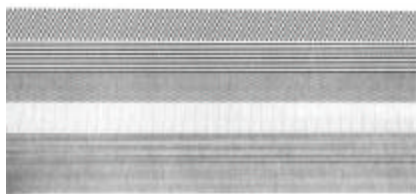
```

FRI SEPTEMBER 026, 1997 19:29 244
ROM CHECKSUMS
U09
U10
SYSTEM RAM CHECKS___ GOOD  SYSTEM RAM SIZE__ 512 KBYTES
CONFIGURATION
9600, 8, N
DIRECT
INPUT VALUES
PAPER: 228  EDGE: 179 REFL: 0  TEMP: 89
POT : 212  TOFA: 133 RIBN: 0
COUNTER INFORMATION
ABSOLUTE VALUES 9-18-1994  RESETTABLE VALUES 9-18-1994
LENGTH___ 773 INCHES  LENGTH___ 576 INCHES
TIME___ 10 HOURS  TIME___ 4 HOURS
MEMORY CONFIGURATION
INTERNAL MODULE___ 12  SCALABLE FONTS___ 10

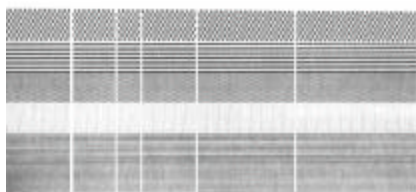
```

Figure 1-12 Configuration Test Label

The second label printed is the test pattern label. This label is used to determine whether the printhead is in need of replacement. 'Good' and 'Bad' Test Pattern labels are shown below:



Good Test Label: Indicates that the printhead is operating normally.



Bad Test Label: Streaks in test label indicate a dirty or faulty printhead. (See Chapter 3 for cleaning and replacement.)

Figure 1-13 Printhead Test Label

1.11 Setting the Printer to the Factory Defaults

With the printer off, press and hold the feed button while turning the printer on. Continue to hold the feed button for 60 seconds and then release. The printer will now be set to the 'Factory Defaults', which are shown in Table 1-1.

Function	Value
Baud Rate	9600
Word Length	8 bits
Print Method	direct thermal
Alternate Character Set	standard
Cutter	disabled
Paper Type	gap

Table 1-1 Factory Default Settings

1.12 Switches and Indicators

Descriptions and locations of the Printer's switches and indicators are shown below.

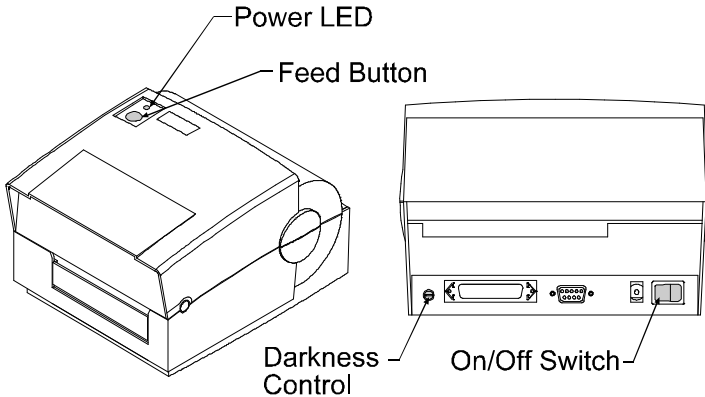


Figure 1-14 Switches and Indicator Locations

Switch/Indicator	Function
ON/OFF switch	Controls power to the Printer.
FEED Button	
Printer in ready state - (LED ON) Press twice Press once	Printer feeds media to first print position of next label. Pauses Printer, press again to resume.
Printer in alarm state - (LED fast flash) Press once	Clears alarm, feeds one label.
Darkness Control	Used to balance a new Printhead so that it prints at the same level of darkness as the previous head.
Power LED Solid ON Slow Flash Fast Flash	Indicates power is supplied and the Printer is ON. Indicates the Printer is in a 'PAUSED' condition. Indicates the Printer is in an 'ERROR' condition such as Media Out, Ribbon Out (if equipped), or Jam.

1.13 Available Options

Thermal Transfer

Thermal transfer printing requires the use of a ribbon. The ink/wax from the ribbon transfers to the media by the printer to create an image. Thermal transfer printing provides exceptional clarity and scannability.

External Cutter

The external cutter provides ease of automatic cutting for tags and labels after a label is printed. This feature attaches to the front of the printer.

Present Sensor

The present sensor allows the printer to be configured for "one up" printing. With the sensor installed, the printer will not print the next label until the previous printed label has been removed from the printer.

DRAM Expansion

The DRAM expansion option increases the printer's memory to 1 MB. The additional memory allows for larger label formats to be loaded into the printer's memory, thereby making it possible to print longer labels.

FLASH Memory Cartridges

FLASH memory cartridges are available in 256K and 512K sizes and are used for permanent storage of custom fonts, formats and graphics.

PC-Batch Software

This label-creation software package is available for IBM® PC or compatibles.

Wall Mount Assembly

This space-saving device allows the printer to be mounted to a wall or other vertical surface using a specially-designed mounting plate.

Time/Date

This feature allows the printer to maintain the current time and date. This is useful when printing labels that require the current time or date to be included within the label format.

External Media Supply Stand

The external media supply option allows the use of large media supply rolls, up to 8-inches in diameter, on 1–3” cores.

External Battery Pack

This option allows the printer to be operated virtually anywhere since its power is not dependent on an AC receptacle. The battery easily attaches to the printer and can last up to 10 hours.



.. Printing Labels

2.0 Introduction

Labels can be generated using RS-232 or parallel communications to a host computer or a PC with a compatible labeling software package. This chapter explains some of the basic programming commands that are required when writing programs to generate label formats. A programmer's manual can be obtained by mailing or faxing the request card located in the back of this manual.

2.1 Programming Commands

In order to be ready for a command sequence, the printer must first receive a special character called an “attention getter” that informs the printer that it is about to receive a command and the type of command it will be. Immediate commands, system-level commands, and font-loading commands each have their own attention getter. The attention getter character is followed by a command character that tells the printer what action to take.

ASCII Char.	Decimal Value	HEX Value	DOS Prompt	Attention Getter For
SOH	1	01	Ctrl A	Immediate Commands
STX	2	02	Ctrl B	System-Level Commands
ESC	27	1B	Ctrl [	Font-Loading Commands

Table 2-1 Attention Getters

When the printer receives an immediate command it will cease whatever it is doing and perform that command. Commands of all types must be in this sequence:

1. Attention Getter
2. Command Character
3. Parameters that must be entered by the user (if any).

Command Character	Must Enter Parameters?	Printer Responds?	Command
#	N	Y	Reset
A	N	Y	Send ASCII status string
B	N	N	Toggle pause
C	N	N	Cancel
D	N	N	SOH shutdown
E	N	Y	Send batch quantity
F	N	Y	Send status byte

Table 2-2 Immediate Commands

The system-level commands are used to create formats, load and store graphic information, and control the printer. Table 2-3 provides a brief description and format of each system-level command character.

Char	Description	Format
A	Set time and date	Format: <i>AwmmddyyyhhMMjjj</i> 16 digits total. <i>w</i> = 1 digit week, 1 is Monday <i>mm</i> = 2 digits for month <i>dd</i> = 2 digits for day <i>yyyy</i> = 4 digits for year <i>hh</i> = 2 digits for hour (24 hr ft) <i>MM</i> = 2 digits for minutes <i>jjj</i> = 3 digits for Julian I.D. value
a	Enable feedback characters	Returns 30 after each label and 31 after each batch of labels
B	Get printer time and date information	Print time and date to port
c	Set continuous paper length	<i>cnnnn</i> = length of paper to feed per label
d	Set Printer to double buffer mode	Use to print a label while a second is formatting in memory
E	Set quantity for stored label	<i>Ennnn</i> = Set Quantity for stored label
e	Select edge sensor	for "see through" media sensing.
F	Form feed	Feeds one label at a time
f	Set form stop position (Backfeed)	Set distance to peel (tear off) position <i>fnnn</i> = 3 digits from sensor
G	Print last label format	
I	Input graphics data block "See Programmer's Manual for format"	A bank designation, an optional word length modifier, a format designation, and up to a 16-character string to identify the stored image data
i	Download scalable font	
J	Set pause for each label	
K	Extended System Commands	<i>Kn n</i> = Q - For query D - Database Configuration S, W, or M - Set configuration R - Reset <i>fxxx</i> - 4 digit number, Distance between TOF sensor and stop position r - Resettable counters reset
k	Test RS-232 Port with a Y if ok	Sends character "Y" to RS-232 port
L	Enter Label Formatting Mode	
M	Set maximum label length	<i>Mnnnn</i> = 4 digits (default) Maximum 12 inches

Table 2-3 System-Level Commands (continued)

Char	Description	Format
m	Set metric flag, enter metric mode	All references set to metric until reset
n	Clear metric flag, return to inch mode	
O	Form edge offset (start of print position)	<i>Ommnn</i> = 4 digits, in/100 or mm/10
o	Cycle cutter	
P	Enter character dump mode	
p	Controlled pause	
Q	Clear all memory modules	
q	Clear module	<i>qx</i> = Module I.D. (Uppercase)
r	Select reflective sensor	Used for "black-strip" media sensing, (e.g. continuous tags, butt-cut labels. Stripe must be printed on back side of media)
S	Slew (feed) speed	<i>Sx</i> <i>x</i> = A -C (1.0 to 2.0 ips)
s	Set up for one print buffer	Set for 1 dot buffer processing. Use for full length dot buffer processing.
T	Printhead dot pattern test label	
t	Test RAM memory module (Must be in Test Mode)	<i>a bbbK</i> module good <i>bbb</i> = 256 or 512, for size of module
U	Label format field replacement	
V	Software switch settings	<i>Vn</i> <i>n</i> = 4-Label Present, 2-Internal Batch, 1-Cutter Enable
v	Firmware version information	Sends version string to host
W	Request memory module information	<i>Wx</i> <i>x</i> = F-font, G-graphic, L-label
w	Test FLASH module memory	Takes about 90 seconds
x	Delete module file	<i>xMfname</i> M=Module I.D, F=file type
X	Set default module bank	<i>Xa</i> <i>a</i> - A = Memory Module A
Y	Output sensor values	Dumps sensor values status to RS-232 port
y	Select font symbol set (optional scalable fonts only)	<i>y S xx</i> <i>y</i> = ASCII (0x79) <i>S</i> = ASCII (0x54) <i>xx</i> = symbol selection
z	Pack module	
Z	Print internal information and dot pattern	<i>Zx</i> <i>x</i> = Module I.D

Table 2-3 System-Level Commands (concluded)

A STX L command switches the printer from the system level to the label-formatting mode. All command characters after STX L are interpreted as label formatting commands until the label-formatting mode is terminated with the command character E. All label - formatting commands are terminated with hex value 0D.

CC	Description	Format
:	Set cut by amount (4 digits) The cutter function will perform a cutting action after the number of labels specified.	: <i>nnnn</i> <i>nnnn</i> = 4 digits of labels printed before cut. Default = 0001
A	Set format attribute	<i>An</i> <i>n</i> =1-XOR, 2-Transparent, 3- Opaque, 5-Inverse
C	Set column offset amount	<i>Cnnnn nnnn</i> = in/100 or mm/10
c	Set cut by amount (2 digits)	<i>cnn nn</i> = 2 cut amount
D	Set height and width dot size	<i>h</i> = Horiz. dot size; can be 1 or 2 <i>v</i> = Vert. dot size; can be 1,2, or 3 (0.005" steps) Default is "D22"
E	Terminate field generation and print label	
G	Place data in global register	
H	Enter heat setting (The amount of heat applied per dot row, can be used to help control print quality)	<i>Hnn nn</i> = 2 digits. 1 - 30 10 is nominal and default
m	Set metric mode	The printer must be reset in order to return to standard measure
M	Set mirror image mode ('Mirror Images' current formatted label)	'M' must be re-sent to cancel. * Will not mirror polygons.
P	Print speed	<i>Px</i> <i>x</i> = A -C (1.0 to 2.0 ips)
p	Set label backup speed	<i>px</i> <i>x</i> = A -C (1.0 to 2.0 ips)
Q	Enter quantity of labels to print	<i>Qnnnn nnnn</i> = quantity
R	Set row offset amount	<i>Rnnnn nnnn</i> = in/100 or mm/10
r	Recall stored label format	<i>rnn...n nn...n</i> Label name of up to 16 char. terminated by CR.
S	Slew (feed) speed	<i>Sx</i> <i>x</i> = A -C (1.0 to 2.0 ips)
s	Store label format in module	<i>sann...n</i> <i>a</i> - destination module A Memory Module A <i>nn...n</i> - label name (16 char. max)
T	Set field data line terminator	<i>Tnn nn</i> = 2 digit ASCII Hex 00 - FF
U	Make previous field a string replace field	

Table 2-4 Label-Formatting Commands (continued)

CC	Description	Format
X	Terminate label formatting mode	
y	Select font symbol set (optional scalable fonts only)	y S xx y = ASCII (0x79) S = ASCII (0x54) xx = symbol selection
z or Z	Zero (0) conversion to "O" eliminates slash (/)	
+	Make last field entered increment numeric	+pii Make last entered field incrementing p = Zero fill character ii = Data added to field
-	Make last field entered decrement numeric	-pii Make last entered field decrementing p = Zero fill character ii = Data subtracted from field
>	Make last field entered increment alphanumeric	>pii Make last entered field incrementing 0 - Z p = Zero fill character ii = Data added to field
<	Make last field entered decrement alphanumeric	<pii Make last entered field decrementing 0 - Z p = Zero fill character ii = Data subtracted from field
^	Set count by amount	^nn Set count by amount nn = 2 digits Skip # of labels before updating count fields and time fields

Table 2-4 Label-Formatting Commands (concluded)

There are two special commands used by the printer, the STX S (Recall Global Data) and the STX T (Print Date and Time) commands. Unlike the other label-format commands, which follow the STX L command, these special commands are entered directly into the data field.

Character	Description
<STX>S	Recall global data and place in field
<STX>T	Print time and date

Table 2-5 Special Label-Formatting Commands

The commands used for bit mapped font loading are usually generated by font-creation software. However, the assign font ID number command must be sent to the printer before the font file. Font-loading commands are listed in Table 2-6.

CC	P	PR	Description
*c###D	N	N	Assign Font ID Number ### = ID Number 100 to 999
)s#W	Y	N	Font Descriptor
*c#E	N	N	Character Code # = ASCII Value of Character
(s#W	Y	N	Character Download Data # = Bytes of Bit-mapped Data

Table 2-6 Font-Loading Commands

CC = Command Character

P = Must Supply Parameters? (Y/N)

PR = printer Responds? (Y/N)

2.2 Programming Examples

```
<STX> L <CR>
H07 <CR>
D11 <CR>
19110080100002510K OHM 1/4 WATT <CR>
1a6210000000050590PCS <CR>
E
```



Figure 2-1 Sample Label

The example shown below prints out a Code 3 of 9 bar code with a wide to narrow bar ratio of 3:1 and can be used to print any of the bar codes shown in Appendix B by altering the example's fields. Refer to Figures 2-2 and 2-3 for a brief explanation of the data fields.

```
<STX>L<CR>
D11<CR>
1A93040001501000123456789<CR>
121100000000100Barcode A<CR>
E
```



<STX>L Syntax L on line 1 is used to enter the label formatting mode.

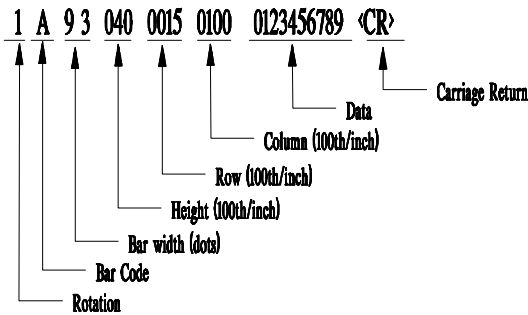


Figure 2-2 Example line 3

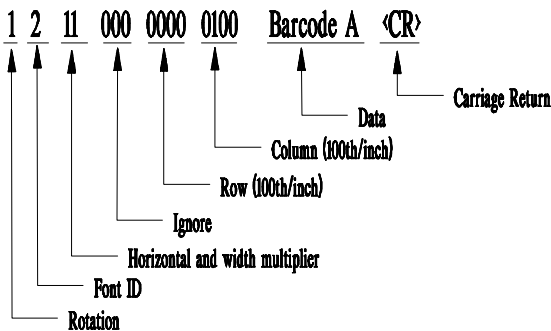


Figure 2-3 Example line 4

2.3 Configuration Command String

The configuration command string sets the operating parameters of the printer. The command strings are described below.

<STX>KDwxy <CR>

where w:

Bit #	Function	Value
0-2	Baud Rate	0=9600*, 1=600, 2=2400, 3=19200, 4=4800, 5=N/A, 6=1200, 7=9600 Test Mode
3	Word Length	0=8 bits*, 1=7bits
4&5	Unused	Set to 0
6	Always 1	Set to 1
7	Always 0	Set to 0

where x:

Bit #	Function	Value
0	Print Method	0=direct thermal*, 1=thermal transfer
1	Present Sensor	0=not equipped, 1=equipped
2	Alternate Char. Set	0=standard*, 1=main frame
3	Cutter	0=disabled*, 1=enabled
4&5	Unused	Set to 0
6	Always 1	Set to 1
7	Always 0	Set to 0

where y:

Bit #	Function	Value
0&1	Paper Type	0=gap*(edge), 1=reflective, 2=continuous (3")
2	Unused	Set to 0
3-5	Unused	Set to 0
6	Always 1	Set to 1
7	Always 0	Set to 0

* = factory defaults

Example: <STX>KD @A@ <CR>

- @ Sets the printer to: 9600 baud; 8 bit word length/no parity.
- A Sets the printer to: thermal transfer; no present sensor; standard character set; no cutter.

@ Sets the printer to: gap (edge) media.

2.4 Memory Cartridges (Modules)

The printer has one memory cartridge slot that can be used to store: graphic images; smooth formed fonts; and label formats that can be recalled by host computers.



Caution

The use of memory cartridges other than those specifically designed for the printer can cause damage to both the cartridge and the printer.

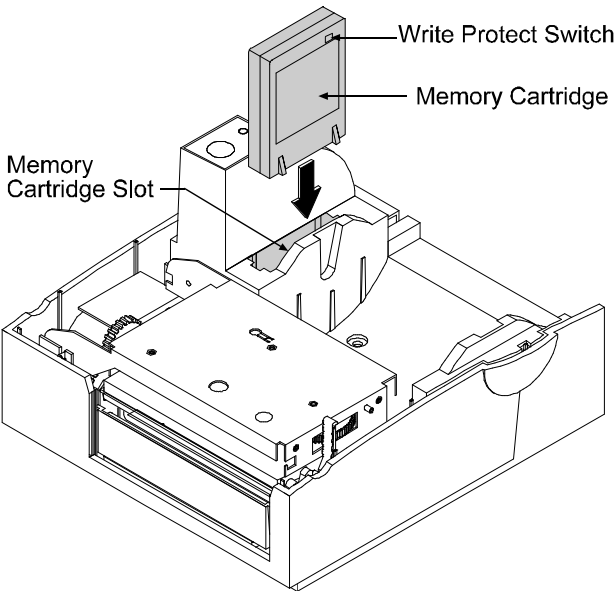


Figure 2-4 Inserting a Memory Cartridge

Note: When turned 'on' the write protect switch will not allow data to be written to the cartridge, ensuring that important data is not overwritten.



Maintenance

3.0 Introduction

This chapter covers the cleaning, adjusting, and some troubleshooting tips involved with your printer. In addition, the following table provides a recommended cleaning schedule for the various parts of your printer.

Area	Method	Interval
Printhead	Turn off the printer before cleaning the printhead. Use solvent* on a cotton swab to clean the printhead from end to end.	After every roll of media.
Platen Roller	Turn the power off. Rotate the platen roller and clean it thoroughly with solvent* and a cotton swab.	After every roll of media.
Peel-Off Roller	Rotate the peel-off roller and clean it thoroughly with solvent* and a cotton swab.	After every roll of media.
Media Path	Solvent*	After every roll of media.
Peel/Tear Bar	Solvent*	As needed
Media Sensor	Air blow	Monthly
Exterior	Mild detergent or desktop cleaner.	As needed
Interior	Brush or vacuum cleaner	As needed.

* Recommend using a solvent that contains isopropyl alcohol.

3.1 Cleaning the Printhead

Warning: Turn 'off' the printer and unplug the unit from the outlet before cleaning the printhead.

1. Turn 'off' the printer and open the cover.
2. Push the printhead latch back toward the back of the printer and raise the printhead carrier assembly.
3. Using a cotton swab dipped in isopropyl alcohol, rub the cotton swab along the printhead.

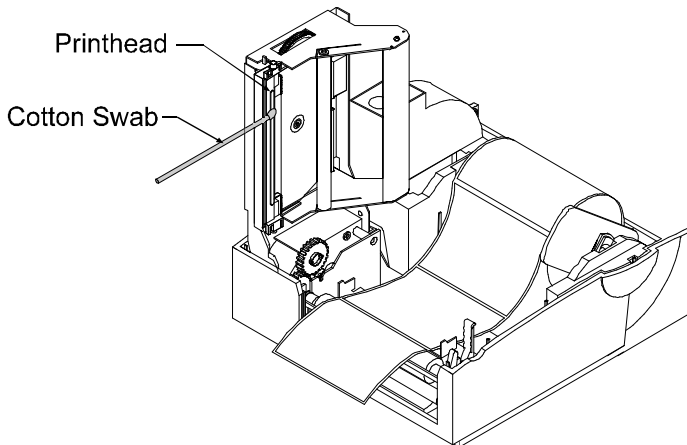


Figure 3-1 Cleaning the Printhead

Note: The printhead should be cleaned every time a new roll of media is installed.

3.2 Fine Printhead Adjustment

A fine printhead adjustment set screw is located on top of the printhead carrier assembly that can be used for adjusting print quality. This adjustment is set at the factory and should not need further adjusting; however, with different types and thickness of media some adjustment may be necessary.

To adjust the printhead, turn the set screw until optimum print quality is obtained, (some trial and error may be necessary).

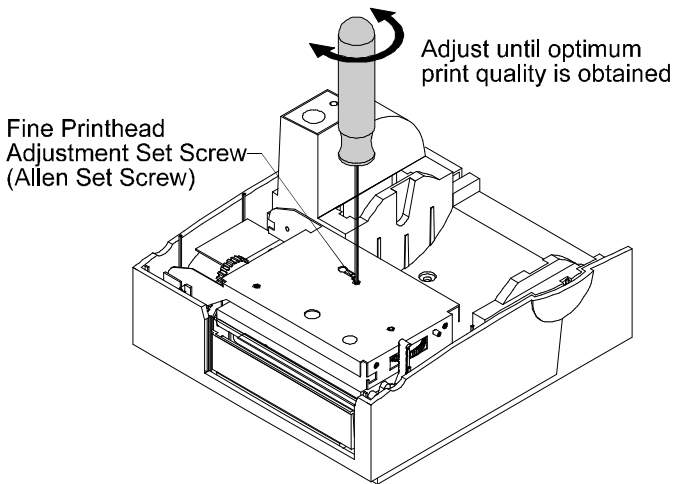
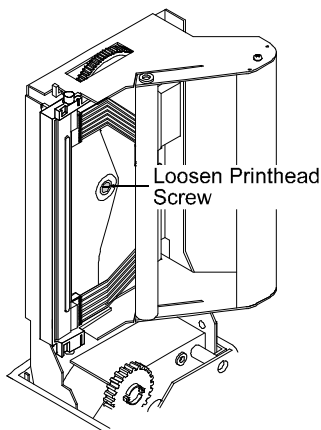


Figure 3-3 Fine Printhead Adjustment

3.3 Printhead Replacement (203 DPI)

Removal:

1. Turn off the printer.
2. Unlatch the printhead carrier assembly.
Loosen the printhead screw until it is free from the printhead.
Carefully remove the printhead from the printhead carrier assembly.



3. Remove the printhead cables from the back of the printhead.

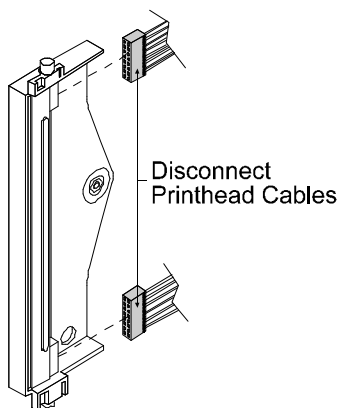


Figure 3-4 Disconnecting the Printhead Cable

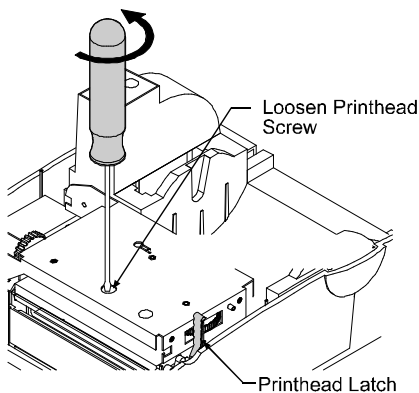
Replacement:

1. Connect the printhead cables to the new printhead.
2. Position the printhead on the printhead carrier assembly and tighten the printhead screw.
3. Ensure that the printhead cable is not pinched and that the printhead is clean.

3.4 Printhead Replacement (300 DPI)

Removal:

1. Turn off the printer.
2. Unlatch the printhead carrier assembly, Loosen the printhead screw until it is free from the printhead. Carefully remove the printhead from the printhead carrier assembly.



3. Remove the printhead cables from the back of the printhead.

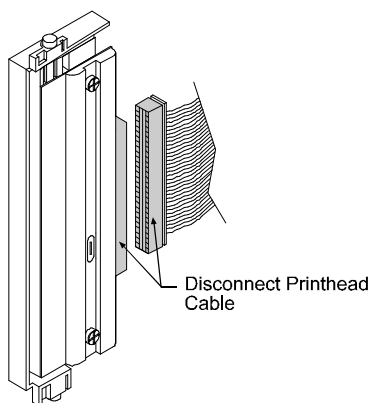


Figure 3-5 Disconnecting the Printhead Cable

Replacement:

1. Connect the printhead cables to the new printhead.
2. Position the printhead on the printhead carrier assembly and tighten the printhead screw.
3. Ensure that the printhead cable is not pinched and that the Printhead is clean.



.. Troubleshooting

4.0 Introduction

Occasionally situations occur that require some troubleshooting skills. Possible problem situations and potential solutions are listed in this section. While not every situation is addressed, you may find some of these tips helpful. After the correction action is taken press the feed button to clear the alarm. Contact a qualified service technician for problems that persist or are not covered in this section.

Unacceptable print quality:

- Dirty printhead. Clean the printhead, (see Section 3.1).
- The printhead temperature is too high. Use the software control to adjust the burn time or heat setting or adjust the darkness POT located on the back of the printer.
- The incorrect ribbon/paper combination is being used, check the ribbon type being used.

The Printer does not print or prints several labels at once:

- The labels are incorrectly loaded, see the loading instructions on the inside cover of the printer, or Section 1.6.
- The media sensor or media sensor circuitry may be defective, call for service.

The ribbon does not advance

(The printer advances paper but ribbon does not advance).

- The ribbon is installed incorrectly. Make sure that the dull side (side with ink) is facing the paper.
- A bad ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon. Ensure that the correct type of ribbon is being used.

Skips every other label

(Print quality is good but skips every other label).

- The label is formatted too close to the top edge of the form. Leave white space equal to 8-dot rows at the top of the label, approximately .02" (.5mm).
- The media sensor or media sensor circuitry may be defective, call for service.

Unable to print in rotation 4

- The characters are formatted outside the dimensions of the label. Check that the row/column values provide enough room for the height of the characters or bar code to be printed.

Prints light on the right side of the label

- The media width adjustment thumbwheel is set for a narrower media width than the actual media being used, (see Section 1.9).
- The printhead is adjusted for thick media or cardstock.
- The printhead is not properly aligned, call for service.
- The printhead is not locked down.

Printer fails to turn on

- A fuse may be blown, call for service.
- Faulty AC cord.
- A bad power switch may exist on the printer, call for service.
- A faulty AC wall outlet.

Label advances 1-2 inches before a fault indication

- The ribbon is installed incorrectly. Make sure that the dull side (side with ink) is facing the paper.
- A bad ribbon/paper combination is resulting in an insufficient amount of friction between paper and ribbon. Ensure that the correct type of ribbon is being used.

Label advances 12 inches before a fault indication

- The media sensor or media sensor circuitry may be defective, call for service.

The labels start to print on an angle and the top-of-form is not able to be sensed, (improper tracking of media) $\frac{3}{4}$ commonly seen when switching between various widths of stock.

- The media is not loaded properly, see Section 1.6. When loading media be certain that the media hub and media guide are against the media.



Appendix A

ASCII Control Code Chart

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
NUL	0	00		32	20	@	64	40	`	96	60
SOH	1	01	!	33	21	A	65	41	a	97	61
STX	2	02	Ò	34	22	B	66	42	b	98	62
EXT	3	03	#	35	23	C	67	43	c	99	63
EOT	4	04	\$	36	24	D	68	44	d	100	64
ENQ	5	05	%	37	25	E	69	45	e	101	65
ACK	6	06	&	38	26	F	70	46	f	102	66
BEL	7	07	Ô	39	27	G	71	47	g	103	67
BS	8	08	(	40	28	H	72	48	h	104	68
HT	9	09	)	41	29	I	73	49	i	105	69
LF	10	0A	*	42	2A	J	74	4A	j	106	6A
VT	11	0B	+	43	2B	K	75	4B	k	107	6B
FF	12	0C	,	44	2C	L	76	4C	l	108	6C
CR	13	0D	-	45	2D	M	77	4D	m	109	6D
SO	14	0E	.	46	2E	N	78	4E	n	110	6E
SI	15	0F	/	47	2F	O	79	4F	o	111	6F
DLE	16	10	0	48	30	P	80	50	p	112	70
DC1	17	11	1	49	31	Q	81	51	q	113	71
DC2	18	12	2	50	32	R	82	52	r	114	72
DC3	19	13	3	51	33	S	83	53	s	115	73
DC4	20	14	4	52	34	T	84	54	t	116	74
NAK	21	15	5	53	35	U	85	55	u	117	75
SYN	22	16	6	54	36	V	86	56	v	118	76
ETB	23	17	7	55	37	W	87	57	w	119	77
CAN	24	18	8	56	38	X	88	58	x	120	78
EM	25	19	9	57	39	Y	89	59	y	121	79
SUB	26	1A	:	58	3A	Z	90	5A	z	122	7A
ESC	27	1B	;	59	3B	[	91	5B	{	123	7B
FS	28	1C	<	60	3C	\	92	5C	|	124	7C
GS	29	1D	=	61	3D	]	93	5D	}	125	7D
RS	30	1E	>	62	3E	^	94	5E	~	126	7E
US	31	1F	?	63	3F	_	95	5F		127	7F

Note: For the software handshake XON/XOFF commands:
XON=(DC1) **XOFF** =(DC3)

ASCII Control Code Chart

Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex	Char	Dec	Hex
Ç	128	80	á	160	A0		192	C0	Ó	224	E0
ü	129	81	í	161	A1		193	C1	ß	225	E1
é	130	82	ó	162	A2		194	C2	Ô	226	E2
â	131	83	ú	163	A3		195	C3	Û	227	E3
ä	132	84	ñ	164	A4		196	C4	ô	228	E4
à	133	85	Ñ	165	A5		197	C5	Õ	229	E5
â	134	86	ª	166	A6	ã	198	C6	µ	230	E6
ç	135	87	º	167	A7	Ã	199	C7	þ	231	E7
ê	136	88	¿	168	A8		200	C8	ƒ	232	E8
ë	137	89	®	169	A9		201	C9	Ú	233	E9
è	138	8A		170	AA		202	CA	Û	234	EA
ï	139	8B	1/2	171	AB		203	CB	Ü	235	EB
î	140	8C	1/4	172	AC		204	CC	ý	236	EC
ì	141	8D	¡	173	AD		205	CD	Ý	237	ED
Ä	142	8E		174	AE		206	CE		238	EE
Å	143	8F	ˆ	175	AF		207	CF		239	EF
É	144	90		176	B0	ð	208	D0		240	F0
æ	145	91		177	B1	Ð	209	D1	±	241	F1
Æ	146	92	²	178	B2	Ê	210	D2		242	F2
ô	147	93	³	179	B3	Ë	211	D3	3/4	243	F3
ö	148	94	´	180	B4	Ë	212	D4		244	F4
ò	149	95	Á	181	B5		213	D5		245	F5
û	150	96	Â	182	B6	Í	214	D6	÷	246	F6
ù	151	97	Ã	183	B7	Î	215	D7	¸	247	F7
ÿ	152	98	©	184	B8	Ï	216	D8	°	248	F8
Ö	153	99	¹	185	B9		217	D9	ˆ	249	F9
Û	154	9A		186	BA		218	DA	·	250	FA
ø	155	9B	»	187	BB		219	DB		251	FB
£	156	9C		188	BC		220	DC		252	FC
Ø	157	9D	¢	189	BD		221	DD		253	FD
x	158	9E	¥	190	BE	ÿ	222	DE		254	FE
f	159	9F		191	BF		223	DF		255	FF



Appendix B

Printer Specifications

Mechanical

Width	8.8" (22.35 cm)
Depth	10.1" (25.65 cm)
Height	6.2" (15.75 cm)
Weight	7 lbs. (3.2 kg)
Operating Temperature	40° F to 100° F (4° C to 38° C)

Printer Specifications

Print Type	Direct Thermal
Print Speed	1, 1.5, and 2" per second
Resolution	203 dpi (8 dots/mm) 300 dpi (11.8 dots/mm)
Tear Bar	Tear up
DRAM Memory	512 kb
EPROM Memory	512 kb

Media/Ribbon

Media Types	Roll-Fed, Die-Cut, Continuous, Fan-Fold
Max. Media Width	4.65" (118 mm)
Max. Print Width	4.1" (104 mm)
Min. Print Width	1" (25 mm)
Max. Print Length	12" (305 mm) with standard RAM
Min. Print Length	.375" (.95 cm) .5" (1.27 cm) w/ Present Sensor
Media Thickness	.0025" - .01" (.0635 mm - .254 mm)
Supply Roll Capacity	4" O.D. on 1" core
Max. Ribbon Width	4.3" (109mm)
Optional Ribbon	Matched to media; approx. 361' (110m) long 1.5" O.D. on .5" core

Communications

Interface	RS-232 (DB-9), and Centronics Parallel
Baud Speed	1200 to 19200 bps
Handshaking	Xon/Off, CTS, DTR
Parity	Even, Odd, or None
Stop Bits	1 or 2
Data Bits	7 or 8

Electrical

External Power Supply	Nominal 115 or 230 VAC IN/ 19 VAC OUT
-----------------------	--

Fonts

- 10 Resident Styles
- Resident Fonts Expandable to 8x
- Reverse Image
- Rotated 0, 90, 180, 270 degrees

Available Bar Codes

- Code 39, Ext Code 39, Code 93, Ext Code 93, Code 128 UCC, Code 128
- A, B & C, Codabar, Interleaved 2 of 5, UPC-A, UPC-E, UPC Ship C Code, EAN-13, EAN-8, EAN 128, POSTNET, MaxiCode, PDF417

Options

- Present Sensor
- FLASH Memory Cartridges
- External Cutter
- Thermal Transfer
- DRAM Memory, (Expandable to 1MB)
- Wall Mount
- External Battery Pack
- Time/Date
- External Media Supply Stand
- PC Batch™ Software



Appendix C

Available Fonts and Bar Codes

All character fonts and bar codes available with the printer are described in this section. Each font and bar code has a name associated with it for use in programming. Human-readable fonts have numeric names while bar code fonts have alpha names. Uppercase alpha names will print bar codes with human readable interpretations. Lowercase alpha names will print bar codes only.

Fonts

Fonts 0 through 8 use the slash zero (Ø) conventions for distinguishing between the zero and the alphabetic O. These fonts are non-proportional (monospaced) fonts; all of the characters take up the same amount of space when printed. The sizes of these fonts are shown in Table B-2.

The Triumvirate font number 9 is a proportional font; each character will take up a different amount of space when printed.

Font	Valid ASCII Characters
0	32-127
1	32-168, 171, 172, 225
2	32-168, 171, 172, 225
3	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225
4	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225
5	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225
6	32, 35-38, 40-58, 65-90, 128, 142-144, 146, 153, 154, 156, 157, 165, 168, 225
7	32-126
8	32, 48-57, 60, 62, 67, 69, 78, 83, 84, 88, 90
9	32-126, 128-169, 171-173, 181-184, 189, 190, 198, 199, 208-216, 222, 224-237, 241, 243, 246-250

Table B-1 Valid Human-Readable Font ASCII Characters

Table B-2 lists the font sizes. The numbers indicate the number of dots.

FONT	HEIGHT	WIDTH	SPACING
Font 0	7	5	1
Font 1	13	7	2
Font 2	18	10	2
Font 3	27	14	2
Font 4	36	18	3
Font 5	52	18	3
Font 6	64	32	4
Font 7	32	15	5
Font 8	28	15	5

Table B-2 Font Sizes

Font 0 96-character alphanumeric, upper and lower case.

```
Font 0
!"#$%&'()*+,-./
0123456789:;<=>?@
ABCDEFGHIJKLMNQP
RSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz
parstuvwxyz2<:)"
```

Font 1 145-character upper and lower case alphanumeric w/ descenders and ascenders.

```
Font 1:
!"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNQPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz
CüéáàááçèèèìíîÏÆøffóóó
úúÿ0Ùø£Ø×fa iouñNªº¼½¾
```

Font 2 138-character alphanumeric, upper and lower case.

```
Font 2:
!"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNQPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz
CüéáàááçèèèìíîÏÆøffóóó
úúÿ0Ùø£Ø×fa iouñNªº¼½¾
```

Font 3 62-character alphanumeric, uppercase.

```
FONT 3:
#$%&'()*+,-./0123456789:
ABCDEFGHIJKLMNQPQRSTUVWXYZ
ÇÆœÜø£ØN¿ß
```

Font 4 62-character
alphanumeric, uppercase.

Font 5 62-character
alphanumeric, uppercase.

FONT 4:
\$ % & () * + . - / 0 1 2 3 4 5 6 7 8 9 :
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ç Ä Å É Ö Ù £ Ø Ñ Ì ß

FONT 5:
\$ % & () * + . - / 0 1 2 3 4 5 6 7 8 9 :
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Ç Ä Å É Ö Ù £ Ø Ñ Ì ß

Font 6 62-character alphanumeric, uppercase.

FONT 6:
\$ % & () * + . - /
0 1 2 3 4 5 6 7 8 9 :
A B C D E F G H I J K L
M N O P Q R S T U V W X Y Z
Ç Ä Å É Ö Ù £ Ø Ñ Ì ß

Font 7 OCR-A, size I.

Font 8 OCR-B, size III.

Font 7:
! " # \$ % & ' () * + , - . /
0 1 2 3 4 5 6 7 8 9 : ; < = > ? @
A B C D E F G H I J K L M N O
P Q R S T U V W X Y Z [\] ^ _ `
a b c d e f g h i j k l m n o
p q r s t u v w x y z { | } ~ ¯

Font 8:
0123456789
<>CENSTXZ|

Font 9 Internal Triumvirate font.

Point sizes are selected by the number in the bar code height.
Larger point sizes can be obtained by increasing the height and width multipliers (see the Programmer's Manual for more information).

4 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
5 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
6 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
8 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
10 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
12 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
14 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789
18 pt ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789

Bar Codes

Font	Length	Cksum	Valid ASCII Characters	Bar widths
A	Varies	No	32, 36, 37, 42, 43, 45-57, 65-90	2:1 - 3:1
B	11	Yes	48-57 Numeric only Option V used in the 6th & 7th position	2:1 - 4:1
C	6	Yes	48-57 Numeric only	2:1 - 4:1
D	Varies	No	48-57 Numeric only	2:1 - 3:1
E	Varies	M-103	32-127	2:1 - 4:1
F	12	Yes	48-57 Numeric only Option V used in the 7th & 8th position	2:1 - 4:1
G	7	Yes	48-57 Numeric only	2:1 - 4:1
H	Varies	M-43	32, 36-39, 42, 43, 45-57, 65-90	2:1 - 3:1
I	Varies	No	36, 43, 45-58, 65-68	2:1 - 3:1
J	Varies	M-10	48-57 Numeric only	2:1 - 3:1
K	Up to 14	M-10	48-57 Numeric only Option + is Last Character for Second M-11 Checksum	2:1 - 3:1
L	13	M-10	48-57 Numeric only	2:1 - 3:1
M	2	Yes	48-57 Numeric only	2:1 - 4:1
N	5	Yes	48-57 Numeric only	2:1 - 4:1
O	Varies	No	0 - 127 ASCII characters	2:1 - 4:1
p	Varies	Yes	48-57 Numeric only	Same as fonts
Q	19	Yes	48-57 Numeric only	2:1 - 4:1
R	18	Yes	48-57 Numeric only	2:1 - 4:1
S	34 +	Yes	48-57 Numeric only	2:1 - 4:1
T	Varies	Yes	0 - 127 ASCII characters	2:1 - 4:1
u	84	Yes	Alpha numeric	N/A
v	1	No	A, B, C, D	Same as fonts
z	Varies	Yes	All	Any Ratio

Table B-3 Bar Code Characteristics

Uppercase bar code identifiers (I.D's) have corresponding lowercase I.D's that when selected suppress printing of associated human-readable text.

Bar Code A Code 3 of 9



Bar Code B UPC-A



Bar Code C UPC-E



Bar Code D Interleaved 2 of 5



Bar Code E Code 128



Bar Code F EAN-13



Bar Code G EAN-8



Bar Code H Health Industry Bar Code (HBIC)



Bar Code I Codeabar



Bar Code J Interleaved 2 of 5
w/modulo 10
checksum



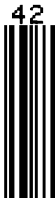
Bar Code K Plessey



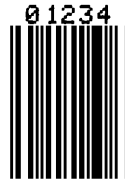
Bar Code L Interleaved 2 of 5
w/modulo 10
checksum and
shipping bearer bars



Bar Code M 2 Digit UPC
addendum



Bar Code N 5 Digit UPC
addendum



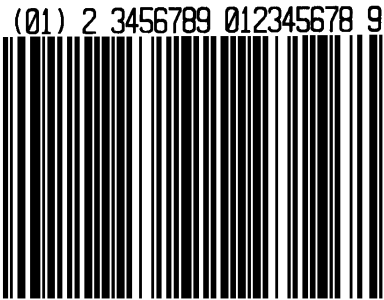
Bar Code O Code 93



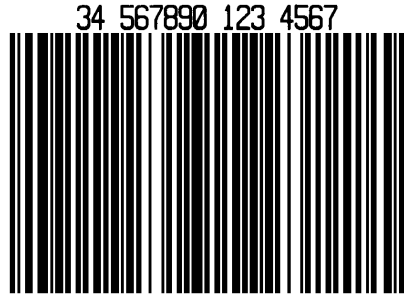
Bar Code p Postnet



Bar Code Q UCC/EAN Code
128



Bar Code R UCC/EAN Code
128 KMART NON
EDI



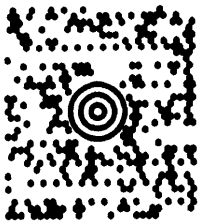
Bar Code S UCC/EAN Code
128 Random
Weight



Bar Code T Telepen



Bar Code u UPS MaxiCode



Bar Code v FIM



Bar Code z PDF-417





Appendix D

Error Codes

The error codes that may be transmitted by the printer are described here.

Lowercase "v"

There is an input buffer overflow situation.

Uppercase "R"

This code is sent every time the printer is turned on. It signals that there was a hardware reset.

Uppercase "T"

This code signals that there was a software reset. A software reset results from sending the <SOH># command sequence to the printer or by doing a front panel reset.



Appendix E

Warranty Information

Datamax

Limited Warranty Statement

Ovation[™]2 Label Printer

Printer

Datamax Corporation warrants to Purchaser that under normal use and service, the Ovation[™]2 Label Printer purchased hereunder shall be free from defects in material and workmanship for a period of one year, (365 days), from the date of shipment by Datamax Corporation.

Expendable and/or consumable items or parts such as lamps, fuses, labels and ribbons are not covered under this warranty. This warranty does not cover equipment or parts which have been misused, altered, neglected, handled carelessly, or used for purposes other than those for which they were manufactured. This warranty also does not cover loss, damages resulting from accident, or damages resulting from unauthorized service.

Thermal Printhead

This warranty is limited to a period of one year, (365 days), or 1,000,000 linear inches of use, whichever comes first, for the Ovation™2 Label Printer thermal printhead. This one year, (365 day), warranty is valid only if a Datamax-approved thermal or thermal transfer label media is used, as defined in the then current Datamax list of approved thermal/thermal transfer media, a copy of which is available from Datamax. Failure to use Datamax-approved media is justification for invalidation of this thermal printhead warranty. This warranty does not cover printheads which have been misused, altered, neglected, handled carelessly, or damaged due to improper cleaning or unauthorized repairs.

Warranty Service Procedures

If a defect should occur during the warranty period, the defective unit shall be returned, freight and insurance prepaid, in the original shipping containers, to Datamax at: 4724 Parkway Commerce Blvd., Orlando, Florida 32808. A Return Material Authorization (RMA) number must be issued before the product can be returned. To open an RMA please call Datamax Customer Service Support Department at (407) 523-5540. Please include your RMA number on the outside of the box and on the shipping document. Include a contact name, action desired, a detailed description of the problem(s), and examples when possible with the defective unit. Datamax shall not be responsible for any loss or damages incurred in shipping. Any warranty work to be performed by Datamax shall be subject to Datamax's confirmation that such product meets Datamax's warranty. In the event of a defect covered by its warranty, Datamax will return the repaired or replaced product to the Purchaser at Datamax's cost.

With respect to a defect in Hardware covered by the warranty, the warranty shall continue in effect until the end of the original warranty period, or for sixty (60 days) after the repair or replacement, whichever is later.

General Warranty Provisions

Datamax makes no warranty as to the design, capability, capacity or suitability of any of its hardware, supplies, or software.

Software is licensed on an 'as is' basis without warranty.

Except and to the extent expressly provided herein, and in lieu of all other warranties, there are no warranties, expressed or implied, including, but not limited to any warranties of merchantability or fitness for a particular purpose.

Purchaser shall be solely responsible for the selection, use, efficiency and suitability of Datamax's products.

Limitation of Liability

In no event shall Datamax be liable for any indirect, special, or consequential damages or lost profits arising out of or relating to Datamax's products, or the performance or nonperformance thereof, even if Datamax has been advised of the possibility thereof.

Datamax's liability, if any, to its purchaser or to any customer(s) of its purchaser shall in no event exceed the total amount paid to Datamax by the initial purchaser of the defective product.

In the event any implied warranties (including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose) are found to exist, such warranties are limited in duration to the period of the warranties set forth above.

Some States do not permit the exclusion of incidental or consequential damages, and in those States the foregoing limitations may not apply. The warranties here give you specific legal rights, and you may have other legal rights which vary from State to State.

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