MODEL 466

THERMAL TRANSFER PRINTER

OPERATOR'S MANUAL

Part Number 880015-0213

- Revised: March 21, 2001 MSG -

Table of Contents

List of Tables

List of Figures

Introduction

The Model 466 is a Direct Thermal or Thermal Transfer label printer with a high resolution (832 dots or 8 dots/mm), 4.09 inch wide print head. Through the use of dual processors, the printer has the ability to handle a wide variety of labeling tasks.

The resident Label Design Software (LDS) is a powerful and easy-to-use package that allows you to create personalized label formats. It can be driven from a PC, mini-computer, mainframe, and most special purpose computers.

Among many other features, LDS supports downloadable graphics and fonts, multiple serial numbering, and flexible character kerning. It offers many font sizes and all popular bar code symbologies. Graphic images can be printed or stored in the printer's memory for future use. Bitmapped Fonts, bar codes, and graphic images can be multiplied in size and printed in 0,90,180,270 degree rotations. Once the labels are designed, they can be stored in the printer for high speed access.

The 466 is capable of printing on most types of label or fax stock. It offers operation in a tag/tear, peel-and-dispense, or cut-off mode. It can handle blow-hole, black-line, label gap, and continuous stock.

Many printer applications use the same label format, but change the data on every label. This is not a problem for the 466 printer. Data may be changed without down-loading the same fixed format, or fixed data fields, time after time. This, along with a greatly increased communication speed, increases data access time and productivity.

Microcom also offers a line of software packages which allow quick and easy on-screen label designing, along with database capabilities.

CHAPTER 1: FEATURES AND SPECIFICATIONS

The Model 466 Direct Thermal / Thermal Transfer printer is designed with many standard features that are unique when compared to other printers. The 466 is built to meet the demands of complicated applications and rigorous use.

1.1   SPECIAL FEATURES
- Direct thermal or thermal transfer tag/ticket feed operation

- Dot history temperature control

- Resolution of 8 dots/mm (.0049" per dot) and a print width of 832 dots (4.09")

- WYSIWYG software compatible

- Print speed up to 8.0 inches per second

- Slew speed up to 12.0 inches per second

- Internal media supply holds roll sizes up to 8 inches OD

- Prints on die-cut, continuous, fax, or preprinted labels up to 9.0 mil thick

- Software-controlled contrast adjustment

- Standard memory of 512KB ROM and 512KB RAM

- Internal date and time keeping

- Easy to load label path

- Detects label gap, black line, or blow-hole stock

- Internal statistical counter for inches and labels printed

- Downloadable bitmap fonts and graphics

- Field incrementing and decrementing

- Remote printer interrogation.

1.2   BAR CODES
- Code 39, Interleaved 2 of 5, CODABAR, Code 128, UCC/EAN-128, Code 93, Plessey, Modified Plessey, UPC-A, UPC-E, EAN-8, EAN-13, Postnet, MaxiCode, and PDF-417

1.3 FONTS

● Bitmapped fonts (normal/bold and OCR-A and OCR-B)

● Converted HP LaserJet™ or TrueType® font compatibility

● Fonts can be printed with proportional or non-proportional spacing

● All bitmapped fonts expandable in height and width

● Printable in 0, 90, 180, and 270 degree rotations

1.4 PRINTING

● Optional peel function with take up motor and label present sensor

● Optional internal rewind

● Optional rotary cutter

● Batch and tag/tear mode advances label to the tear bar

● Label back-up prevents wasted media in tag/tear and peel modes

1.5 INTERFACE COMMUNICATIONS

● Serial: RS-232C, 25-pin female D-Sub connector (DCE) and 2Kbytes buffer
　　　　　-Flow control: XON/XOFF, CTS/RTS
　　　　　-Baud rate: 110 to 38400, user-selectable
　　　　　-Parity: odd, even or none
　　　　　-Data bits: 7 or 8

● Parallel (optional): 25-pin female (also includes additional serial port)

1.6 PHYSICAL

● Rigid painted steel construction

● Height: 12" (304.8mm)

● Width: 11" (279.4mm)

● Depth: 18" (457.2mm)

● Weight: 40 LBS (18.14Kg)

1.7 ENVIRONMENT

● Temperature: 0° C to 40° C operating

● Humidity: 10-85% non-condensing

1.8 ELECTRICAL
●   Voltage: 117 VAC nom.,60Hz

●   Current: 3 AMPS maximum

1.9 OPTIONS
●   Cutter

●   Internal rewinder

●   Parallel and second serial port

●   Assorted printer cables

●   On-screen label design PC software packages

●   Windows™ 95/98/NT/2000 driver

●   PCX/BMP to printer graphics conversion PC software

●   TTF/SFP to printer font conversion PC software

●   Battery backed RAM

●   Additional RAM up to 2MB

1.10 PRINTER VARIATIONS
●   230V European power supply

1.11 APPROVALS
●   CUL (UL and CSA), CE, Complies with FCC class A
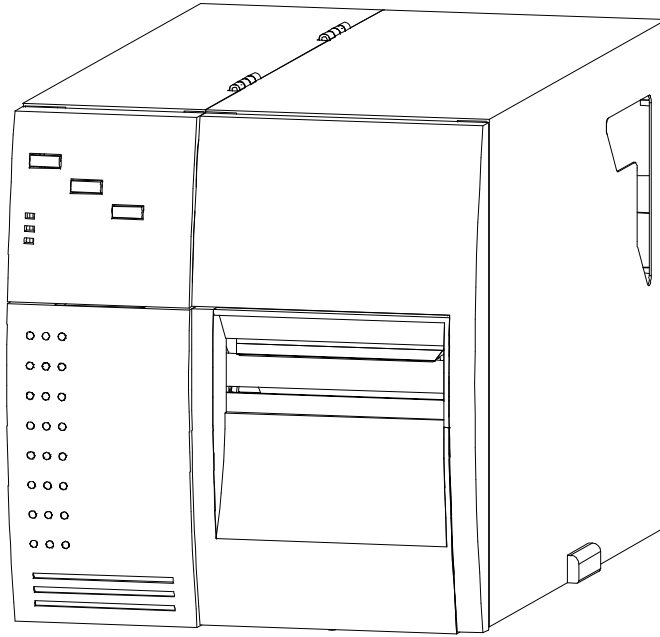
466 Printer
Front View
Figure 1
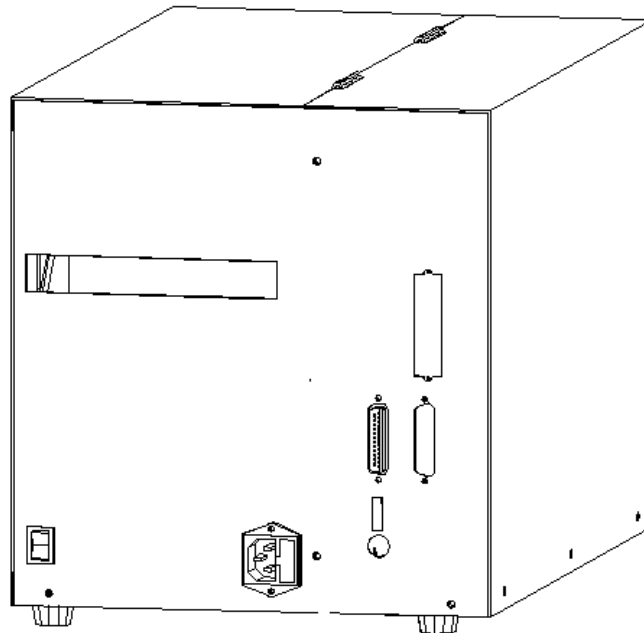
466 Printer
Rear View
Figure 2

CHAPTER 2: BASIC OPERATION

2.1   UNPACKING THE 466 PRINTER

While unpacking the printer, please check all packing materials closely to avoid misplacing any necessary parts. After the printer is removed from the box, verify that all parts are present and in good condition (see Figure 3). All packaging material should be kept and used if the printer is to be shipped. (Some parts shown are optional. Please refer to the packing list or order.)
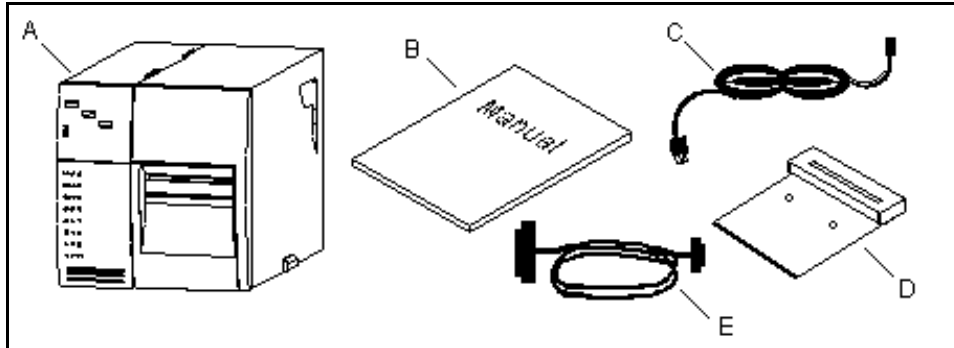
Printer Parts
Figure 3

A.) Printer
B.) Operators Manual
C.) Power Cord
D.) Optional Cutter
E.) Optional Communications Cable

2.2   INITIAL POWER UP

Before connecting the printer to a power source, verify that the voltage printed on the rear panel correctly matches the supply.

Plug the printer in and turn the power switch on. The front panel power LED should turn green. If this does not occur, check the power source and if necessary call your service organization.

2.3   FRONT PANEL SWITCHES AND STATUS LIGHTS

The front panel switches perform several different functions depending on the printer mode:

2.3.1   NORMAL MODE

The "Label Print" button is used to issue a label request. If the button is pressed while the printer is idle, the unit will print a label using the current label format. If the button is pressed while a label is printing, the printer will enter pause mode.

2.3.2   STATUS LABEL MODE

To print a status label, hold the print button while turning on the printer. Release the button and a test pattern with statistical information will be printed (see Figure 4). When a status label is

created, the software dip switches are temporarily set to defaults. The printer will return to the old settings, if different, after power down or a soft reset.

The printed labels and total labels represent the number of labels printed to date. The printed labels and printed inches fields can be reset by the user while the total labels and total inches cannot. Printed inches and printed labels are reset using the ^D29 command (see section 5.3). Other useful information on the power-up label is the unit serial number, power-on hours, previous serial parameters (not the default parameters caused by executing creating a status label), and the revision number of the Label Design Software (LDS).

The switch bank settings reflect the contents of the four software dip switches that configure the operation of the printer. See section 5.3, specifically ^D21, ^D22, ^D23, ^D24, ^D25, and ^D26, for more information on software dip switch settings.

Printer Serial #: 1234567890	Gap Threshold Value: 92
Printed Labels: 8432	Takeup Motor: Disabled
Total Labels: 8498	Comm1 Parameters: 9600-N-8-1
Printed Inches: 25296	Comm2 Parameters: 9600-N-8-1
Total Inches: 25494	Parallel: ACTIVE
Power On Hours: 897	RAM: 524288
Contrast Base: 100	Optional ROM: NONE
Hard Switch Bank 1: 10100000	Cutter Installed: NONE
Soft Switch Bank 1: 10000001	Second Proc. Rev: 2.13
Soft Switch Bank 2: 01010001	RAM Checksum: Enabled
Soft Switch Bank 3: 00000000	466 REV 2.13 070171-0213 07/11/00
Soft Switch Bank 4: 00000000	
Soft Switch Bank 5: 10001011	
Soft Switch Bank 6: 00000000	

Status Label
Figure 4

2.3.3   PAPER-OUT MODE

When a paper out condition occurs, the printer will continuously beep and the red error indicator will light. The front panel switch "Line Feed" serves to load and realign the new label stock. Pressing the "Label Print" button will print a duplicate of the last label printed. The previous label can be repeated until proper registration occurs. To return to the pre-paper out condition, tap the button while the duplicate label is being printed. The red error light should go out and normal printing may resume.

2.4 THE STATUS LIGHTS AND SOUNDS

The status lights have different functions depending upon the mode of the printer. The following table explains the meanings.

Status Light			
Color	**Sound**	**Mode**	**Meaning**
Solid Green	None	All	Power is on.
Solid Green	Long Error	All	Memory operation unsuccessful.
Solid Green	3 Short Beeps	All	Memory operation successful.
Solid Red	Continuous Pulsed Beep	All	Printer error: Caused by a paper-out, ribbon-out, take-up full, or hardware failure. If an unexplained condition persists, contact your service representative.
Flashing Red	Continuous Pulsed Beep	All	Spike or low voltage on the AC line. The unit will remain in this mode until the condition is removed and the printer is powered off.
Solid Yellow	N/A	All	Printer is On-Line.

Table 1

2.5 LOADING PAPER

The 466 can dispense labels in a many different ways. The following two sections explain the dispensing modes. If narrow stock is used (3.5 inches wide or less), it may be necessary to adjust the print head support screw (see section 2.6).

Thermal Transfer Note:
The 466 will, on **power-up**, automatically sense a loaded ribbon and select thermal transfer mode. Please note that the printer will not select thermal transfer mode if the ribbon is loaded after the printer is turned on. To correct the situation simply cycle the power once the ribbon has been loaded.
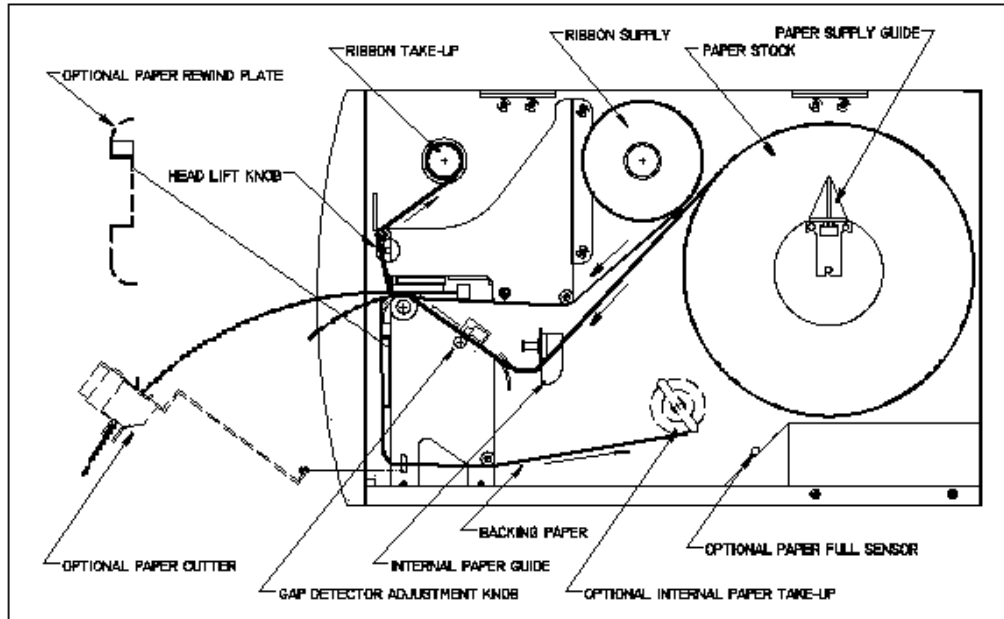
Printer Feed Mechanism
Figure 5

2.5.1 NORMAL AND TAG/TEAR MODES
Place the label roll on the internal supply shaft and adjust the paper width stop. Raise the print head and feed the paper through the printer until it comes out of the front. Lower the print head.

2.5.2 PEEL-AND-DISPENSE MODE (optional)
1.   Follow the paper loading in the normal and tag mode directions.
2.   Mount the peel plate adapter to the front of the printer.
3.   Feed and remove enough labels to expose about two feet of backing paper.
4.   Wrap the backing paper around the peel plate adapter and fasten it to the take up spool.
5.   If necessary, press the line feed button to properly align the labels.
        (Avoid a paper jam, removing the labels as they start to peel.
6.   Enable the peel-and-dispense mode using the ^A1^D98?.
        *If the label height is over 2", a label support rack should be used. This rack will support the peeled label until it is removed.

2.6   PRINT HEAD SUPPORT ADJUSTMENT
When using narrow media, less than 3.5" wide, it is possible to increase print quality and prevent premature drive roller wear by correctly adjusting the print head support screw. To make the adjustment, simply turn the head adjustment screw (see Figure 6) clockwise until the print head is slightly lifted from the drive roller. Once the head has been lifted from the roller(see Figure 7), verify that the print head has not been lifted too far by printing a test label. If the print quality on the right side of the label appears weak, then lower the print head by turning the screw counter clockwise until the print quality is corrected. If the quality problem appears on the left side, turn the screw clockwise until the print quality is corrected.
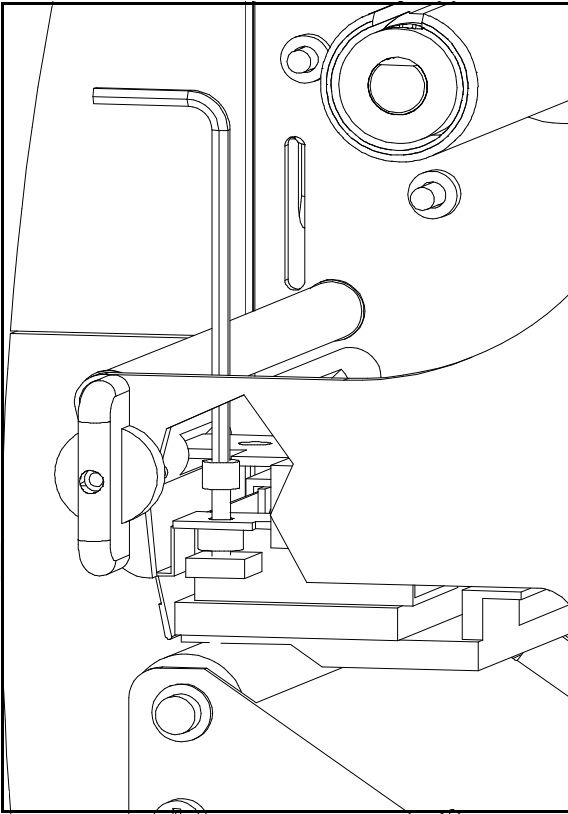
Print Head Adjustment Screw
Figure 6
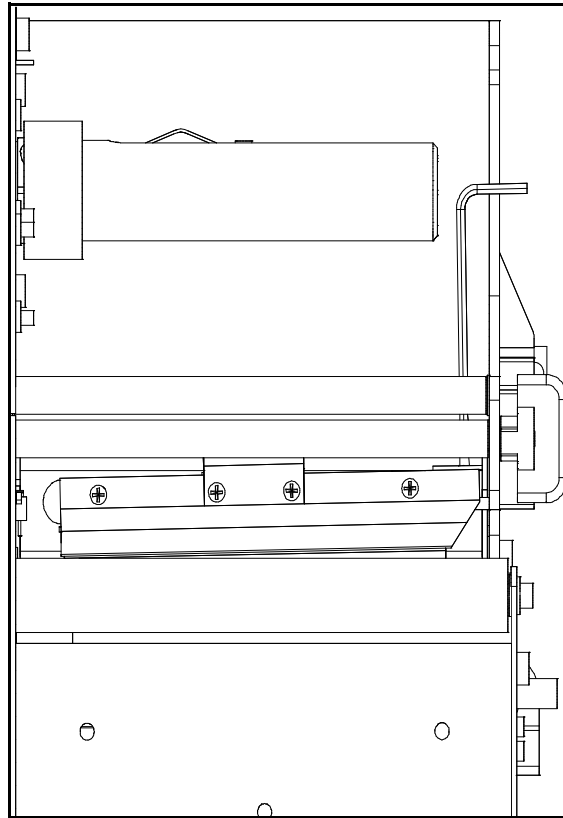
Narrow Label Adjustment
Figure 7

2.7   CLEANING INSTRUCTIONS

The printer and print head should be cleaned every 5,000 labels, every two weeks, or between label roll changes, whichever occurs first. A Microcom cleaning kit (part #040005-0000) should be used for cleaning and maintaining a Microcom printer product. It is important to note that the optimum print head life is achieved by maintaining a clean printer and print head.

To clean the 466 printer:
1)   Turn the printer off.

2)   Lift the print head and remove any label stock.

3)   Use the cleaning brush to sweep away all small label and adhesive particles that may be in the area of the print head.

4)   Moisten a cleaning swab with the cleaning solution and wipe away any adhesive from the rollers or the peel bracket.

5)   Dampen a swab with cleaning solution and gently wipe the underside of the print head. Repeat if necessary (if swab is extremely dirty).

WARNING: DO NOT TOUCH THE PRINT HEAD WITH ANY METAL OR SHARP OBJECTS

CHAPTER 3: COMMUNICATIONS

The 466 can be interfaced to PC's, mini-computers, main frames, and special purpose machines. It is capable of serial RS-232 or optional Centronics® parallel communication. The following sections explain the communication interfaces.

Out of the box, unless otherwise requested, the 466 communicates using serial RS-232 at 9600 bits per second, 8 data bits, 1 stop bit and no parity with both hardware and software handshaking. This configuration may be changed as shown in Appendix C.

3.1   CABLE PINOUT
Table 2 shows the signals of the 25-pin RS-232 serial port configuration.

If serial RS-232 communication is selected and XON/XOFF hand shaking is used, the only signals the 466 requires are the RXD, TXD, and GND signals. If hardware (CTS/RTS) hand shaking is used, a RTS signal is provided. XON/XOFF may be disabled through software dip switch #1 (see Section 5.3.1). The other signals are offered in the event the host computer requires these signals.

```
+-----------------------------------------------------------------------------+
|                          Serial Port Configuration                          |
+--------------------------------------+--------------------------------------+
|             25 TO 9 PIN              |            25 TO 25 PIN              |
+--------------------------------------+--------------------------------------+
| State 466      Direction      PC     | State 466      Direction      PC     |
| HI     8   DCD ---->---- DCD   1     | HI     8   DCD ---->---- DCD   8     |
| XX     3   TXD ---->---- RXD   2     | XX     3   TXD ---->---- RXD   3     |
| XX     2   RXD ----<---- TXD   3     | XX     2   RXD ----<---- TXD   2     |
| HI     6   DSR ----<---- DTR   4     | HI     6   DSR ----<---- DTR  20     |
| LO     7   GND ---<->--- GND   5     | LO     7   GND ---<->--- GND   7     |
| HI    20   DTR ---->---- DSR   6     | HI    20   DTR ---->---- DSR   6     |
| DC     4   CTS ----<---- RTS   7     | DC     4   CTS ----<---- RTS   4     |
| XX     5   RTS ---->---- CTS   8     | XX     5   RTS ---->---- CTS   5     |
| HI    18   +5V                       | HI    18   +5V                       |
|                                      |                                      |
|     DB-25                 DE-9       |     DB-25                 DB-25      |
|                                      |                                      |
|      DC = Do Not Care                |      DC = Do Not Care                |
|      XX = Indeterminate              |      XX = Indeterminate              |
+--------------------------------------+--------------------------------------+
```

Table 2

3.2   PRINTER CABLES

Warning: Connection of a serial 466 to a parallel port may result in damage to the printer and/or computer. Connection of a 466 with a parallel board to a serial port may result in damage to the printer and/or computer.

The printer cables needed for the 466 printer are standard and available through Microcom Corporation. You will not need a NULL-modem cable because the printer is DCE equipment.

For parallel connection, use a standard 25 pin to 36 pin Centronics printer cable, connected from the desired parallel port of the host computer to the 36 pin connector on the optional 466 parallel board.

For serial connection, (standard on the 466)

25 pin serial com port - Use a standard 25 pin female to 25 pin male serial cable.

9 pin serial com port - Use a 9 pin female to 25 pin male cable.

Note: NULL modem cable adapters are not necessary since the printer is DCE equipment.

CHAPTER 4: DESIGNING LABELS USING LDS

Label Design Software (LDS) refers to the software resident in the printer used to decipher label formats sent by the host computer. All fonts, character sets and bar codes symbologies are resident in the printer.

A label format is produced by a series of 5 steps:

    1: Control commands to define printer operation
    2: A header to define label height, width, print speed, etc..
    3: Field data to define placement of text, bar code, graphic or line
    4: Actual text data to place in the above text or bar code fields
    5: Control commands to initiate printing

4.1   CONTROL CHARACTERS

Throughout this manual there are references to control characters. In order to print them in this manual, they have been written using standard characters and icons. Escape characters are represented by <ESC> and a carriage return is represented by the ? symbol. It is important to note that all printer functions, unless otherwise noted, must be followed with a carriage return?.

4.2   GETTING STARTED

There are many different machines that can send information to the 466 printer: For example - main frames, mini-computers, special purpose computers and PC's. However, if you are using the printer for the first time, the easiest way to start is with a PC and a terminal emulation software program. This will allow two-way, serial communication with the printer. You will be able to quickly upload files and access label-sizing and other features that will help considerably in formatting your first labels.

4.2.1   PC CONNECTION (SERIAL)

Items required:
-        A computer with at least one unused serial communications port. (COM1,COM2...)
-        A serial interface cable. (See section 3.2 for cable information)
-        A terminal emulation program for testing. (Such as HyperTerminal™)

Set the communication parameters in the PC terminal software program to 9600 bits per second, no parity, 8 data bits and 1 stop bit. Unless modified by the user, this is the printers' communication configuration out of the box. Send the characters ^D3 and a carriage return character to the printer. If the printer prints a label, proper PC to printer communications have been confirmed. Send the characters ^D5 followed by a carriage return character to verify printer to PC communication. A text response should be returned from the printer.

If a terminal program is not available, it is possible to send files to the printer using the DOS COPY command. To do this, create a text file containing the information to be sent (i.e. ^D3?).

Note: Use an editor that **does not** add its own formatting characters.

Use the following DOS MODE command to set up the appropriate PC port.

Note: COM1 may be any available communications port on your PC.

C:>MODE COM1:9600,N,8,1,P

You must then send the file to the printer using the following DOS command.

C:>COPY FILENAME COM1

4.2.2   PC CONNECTION (PARALLEL)
Items required:
- A computer with at least one unused parallel communications port. (LPT1, LPT2...)
- A parallel interface cable. (See section 3.2 for cable information)

Create a text file containing the information to be sent. (^C is the print command.)

^C

You may use any text editor that does not add its own formatting characters (QEDIT, DOS EDIT...). Send the file to the printer using the following DOS command. Note: LPT1 may be any available printer port on your PC.

C:>COPY FILENAME LPT1

4.2.3   LEARNING LDS
You can test some of the control code functions (see section 5.1) directly through the keyboard. Large label files may be entered in a straight ASCII text word editor and then up-loaded to the printer using a terminal emulation program or the DOS copy command. (To use the DOS copy command, first use the DOS mode instruction to configure the PC. For example, MODE COM1:9600,N,8,1,P).

There are some special features offered by the 466 printer that will aid in label design. For example, the auto-size command (^A2^D39?) will provide most of the header format information needed to define the different properties of label stock. The state of the machine is accessed through the enquiry command (^D5? or ^E). The statistical printer information is made available through the ^A0^D29? command.

The following sections of this chapter are designed to give an overview of a label format, define the label header, and list the different types of field information available. Chapter 5 explains the special functions of the control codes. Once some understanding of these basic concepts are achieved, use the quick reference guide in Appendix B for expedient label design.

4.3 FORMATTING LABELS: AN OVERVIEW

A label format consists of a header record and field records, followed by the text data to be printed. The records describe how the label is to be printed. The header contains information about the label itself such as label height, width, print speed, etc. The field records refer to the data section and contain information about positioning coordinates, the type of character generators or bar codes to use, etc.. The number of fields is limited only by the amount of free memory.

Below is a sample label format. We will refer to this format as we break down the components of its structure.

(See Figure 8)

^D57**?**	A label format is coming
5,812,1218,,20,35	Header information
1,190,1068,8,1,8,,,2,2**?**	Field #1 information
2,139,900,11,1,8,,,2,2**?**	Field #2 information
3,117,760,26,1,8**?**	Field #3 information
4,265,560,11,1,8**?**	Field #4 information
4,123,50,11,16,3,,,3,406**?**	Field #5
^D56**?**	Select RAM Format
^D2**?**	Text Data is Coming
Microcom**?**	Text String #1
Corporation**?**	Text String #2
Thermal Printing Solutions**?**	Text String #3
01234567890**?**	Text String #4
^D3**?**	Print Label 1

The sequence ^D57**?** puts the printer in format entry mode.

The next line is the header information: sizing the label (812 dots wide 1218 dots high).

The next five lines are layout information for each data field in the format.

The sequence ^D56**?** selects the user layout.

The sequence ^D2**?** tells the printer to start accepting data for each defined field. (Field #1 defines where Data #1 should be positioned.) (Note: The label prints from bottom to top.)

The next three lines are data for each field.

Text string #4 is accessed twice. The format will print '01234567890' and then the bar code equivalent.

The sequence ^D3**?** starts the print cycle. (Default is one copy. See section 5.3.2)

Microcom

Corporation

Thermal Printing Solutions

01234567890

Microcom Label
Figure 8

4.4   LABEL HEADER

The header consist of twelve parameters. These parameters contain information about the label. It is not necessary to enter information for all of the parameters: If a parameter is left blank, then the default value will be used. A carriage return must follow the label header parameters.

The value of measurement for many of the header elements is the dot. There are 203 dots per inch on a 466 print head (8 dots/mm). There is a maximum 832 dots in the X direction (width). The Y direction (length) is virtually unlimited.

Most header parameters can be supplied using the auto-size command. (See section 5.3.3.)

Below is a list of the header element mnemonics and their default values:

```
HFM,LSX,LSY,WEB,GAP,DPS,LCB,AGD,SPG,OFX,OFY,,,FMT
  0,832,614, 13, 24, 35,  0,  1,490,  0,  0,,,  0
```
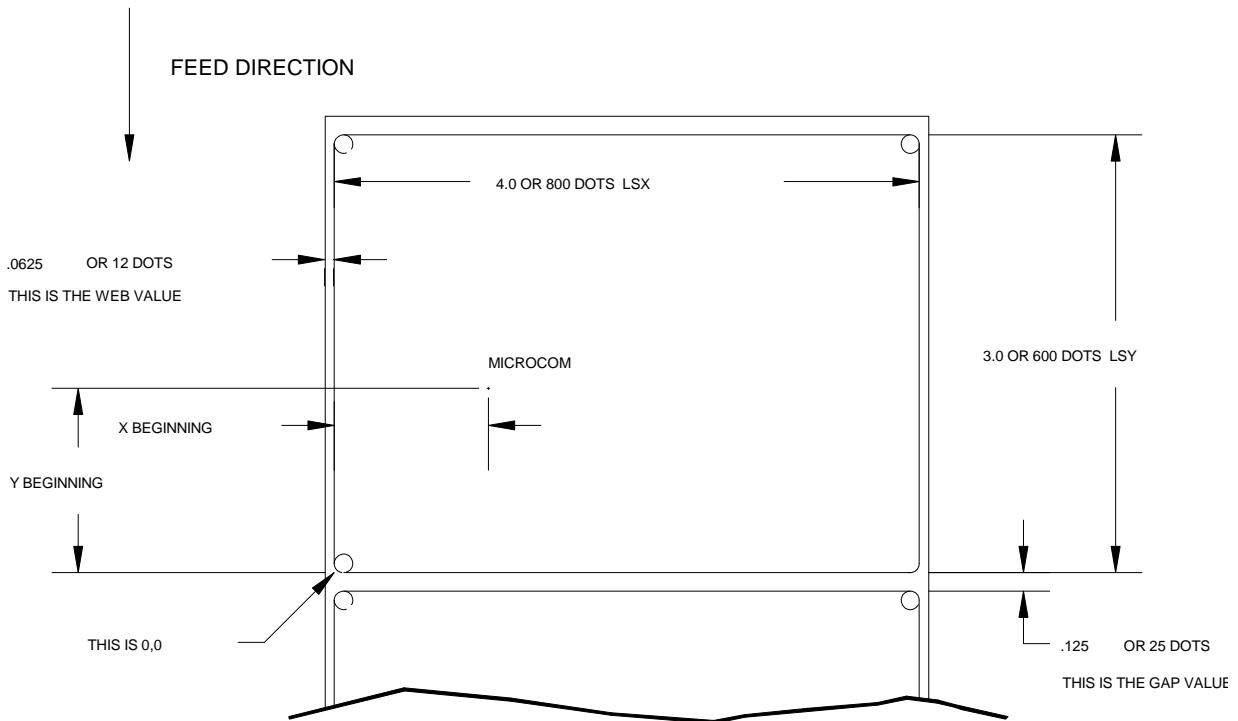

Label Header Parameters of a 4" X 3" Label
Figure 9

Refer to Figure 9 for a visual representation of most header parameters.

The following is a description of each header element:

HFM   NUMBER OF FIELDS IN LAYOUT
This parameter is used to specify the number of fields in the layout. If more fields are defined than what is specified for HFM, the extras will be ignored. To prevent software confusion, do not set the HFM parameter to a number higher than the number of fields defined.

LSX   LABEL SIZE X DIRECTION
Specifies the width of the label in dots. For example: A 3" wide label would have an LSX of 3 x 203 = 609 dots. (203 dots = 1 inch)

LSY   LABEL SIZE Y DIRECTION
Specifies the height of the label in dots.

WEB   WEB SIZE
The width, measured in dots, of the webbing that is found on the left side of the label.

GAP   GAP SIZE
The height, measured in dots, of the gap between labels. Auto-sizing (See section 5.3.3) will define this value.

DPS   PRINT SPEED
The speed the printer prints a label. Generally, better print quality is obtained at lower print speeds.

The labels per minute a particular format will print can be calculated by the equation below:

$$\text{Labels per Minute} = \frac{\text{IPS x 60 seconds}}{\text{Label Height}}$$

The printer's default print speed is 3.2 inches per second (DPS value = 48). To speed it up or slow it down, the following DPS parameters can be inserted into the label header. Note that a higher value slows the printer down and a smaller value speeds it up.

See Table 3 for a list of print speeds, DPS values, and inches per second.

Print Speed			
DPS VALUE	MM PER SECOND	INCHES PER SECOND	INCHES PER MINUTE
00	203.2	8.0	480
01	200.7	7.9	474
02	198.1	7.8	468
03	195.6	7.7	462
04	193.0	7.6	456
05	190.5	7.5	450
06	188.0	7.4	444
07	185.4	7.3	438
08	182.9	7.2	432
09	180.3	7.1	426
10	177.8	7.0	420
11	175.3	6.9	414
12	172.7	6.8	408
13	170.2	6.7	402
14	167.6	6.6	396
15	165.1	6.5	390
16	162.6	6.4	384
17	160.0	6.3	378
18	157.5	6.2	372
19	154.9	6.1	366
20	152.4	6.0	360
21	149.9	5.9	354
22	147.3	5.8	348
23	144.8	5.7	342
24	142.2	5.6	336
25	139.7	5.5	330
26	137.2	5.4	324
27	134.6	5.3	318
28	132.1	5.2	312
29	129.5	5.1	306
30	127.0	5.0	300
31	124.5	4.9	294
32	121.9	4.8	288
33	119.4	4.7	282
34	116.8	4.6	276
35	114.3	4.5	270
36	111.8	4.4	264
37	109.2	4.3	258
38	106.7	4.2	252
39	104.1	4.1	246
40	101.6	4.0	240
41	99.1	3.9	234
42	96.5	3.8	228
43	94.0	3.7	222
44	91.4	3.6	216
45	88.9	3.5	204
46	86.4	3.4	204
47	83.8	3.3	198
48	81.3	3.2	192
49	78.7	3.1	186
50	76.2	3.0	180
51	73.7	2.9	174
52	71.7	2.8	168
53	68.6	2.7	162
54	66.0	2.6	156
55	63.5	2.5	150

Table 3

LCB   LABEL CONTROL BYTE
This parameter selects between the various gap detection methods.

Normal Stock (leading edge): If set to a value of 0, the printer will detect the leading edge of the label (the start of the next label).

Continuous Stock: If set to a value of 2, the printer will not search for a gap or other sense mark. The printer will print all fields that contain data and advance the paper the amount specified in the SPG parameter. Blank or empty fields will not be printed. For example, Imagine a receipt format that contains 100 lines. If data is provided for the first 50 lines, the printer will not advance the "extra" blank 50 lines. The printer will stop immediately after printing the last pixel and then advance the amount specified in the SPG parameter.

If the AGD is set to 0, the printer will always feed the same amount of media regardless of the data. In this case, the amount of label feed is determined by adding the SPG value to the LSY.

Blow Hole Stock (Slot-Cut): If set to a value of 0, the printer will detect the leading edge of a blow hole (see software dip switch #4 (^D24) for blow hole stock).

Black Line Stock (transmissive sensor): If set to a value of 1, the printer will detect the leading edge of a black line.

Black Line Stock (optional reflective sensor): If set to a value of 3, the printer will detect the leading edge of a black line.

AGD   NUMBER OF STEPS TO ACTIVATE GAP DETECTOR
This parameter selects the number of steps (dots) that the printer should skip before gap sensing is activated. This value is usually defaulted.

SPG   NUMBER OF STEPS PAST GAP
The number of steps to advance the label after detection of a label gap. Use auto-sizing (See section 5.3.3) to quickly evaluate this parameter for small stock. It may also be necessary to adjust this value if using material with a sense position not located at the end of the stock.

The 466 uses the following formula to determine the SPG setting:

If label height is greater than or equal to 490 then SPG=490

If label height is less than 490, subtract (LSY+GAP) from 490 until the answer is negative, then add (LSY+GAP) back to become positive again. Subtract the AGD value (usually 1) and the result will be the correct SPG.

If continuous stock is selected in the LCB, an SPG value of 0 will cause the printer to advance paper until the LSY header value plus the SPG header value are reached.

OFX   X DIRECTION OFFSET
This parameter moves all the fields in the X direction without changing the fields themselves. (Positive integers only)

OFY Y DIRECTION OFFSET
This parameter moves all the fields in the Y direction without changing the fields themselves. (Positive integers only)

,,, CONSTANTS

FMT FORCE MEDIA TYPE
This parameter can be configured to produce an error when the media type loaded in the printer does not match the type specified by this parameter. For example: If an application always requires the use of thermal transfer ribbons, this parameter could be set to a value of 2. The printers front panel LED will turn red if a user tries to print a label without first loading a ribbon. The reverse situation could also be configured.

Do Not Force: If set to a value of 0, the printer will print using the mode detected at power-up or the last method selected.

Force Direct Thermal Mode: If set to a value of 1, the printer will print only if ribbon is **not** present in the printer. If an attempt is made to print, and ribbon **is** detected, the printer will sound an error tone, turn on the red error light, and halt.

Force Thermal Transfer Mode: If set to a value of 2, the printer will print only if ribbon **is** present in the printer. If an attempt is made to print, and ribbon is **not** detected, the printer will sound an error tone, turn on the red error light, and halt.

4.4.1 A SAMPLE SESSION (HEADER)

This is the label header from the sample label in section 4.3.

```
5,812,1218,,20,35?
5      -      5 fields following the header
812    -      Label width (LSX) of 812 (812/203 = 4 inches).
1218   -      Label length (LSY) of 1218 (1218/203 = 6 inches).
       -      The WEB parameter can be defaulted.
20     -      GAP between labels of 20  (20/203 = 0.10 inch).
35     -      Print speed (DPS) of 35 = 4.5 in/sec (from Table 3)
       -      No entry for the LCB parameter means default value of
              0, normal stock on backing paper.
       -      The AGD could be defaulted. This value was confirmed
              using the auto-size command.
       -      SPG could be defaulted. This value was confirmed
              using the auto-size function.
?      -      A carriage return must follow the label header. The
              parameters OFX, OFY, and FMT were not entered into
              the header and therefore the printer assumes the
              default values, 0 in their cases. Likewise, since the
              AGD and SPG were defaulted, the carriage return could
              have followed the DPS.
```

Note: Defaulted fields must be separated by commas and ending commas may be omitted.

4.5   LABEL FIELDS
A field is broken down into many different parameters. These parameters contain the information necessary to position data (text, bar codes, graphics, etc.) on the label. It is not necessary to enter values for all of the field parameters; the default values will be used if left blank. The fields to be defaulted must be separated by commas. A carriage return must follow each label field.

4.5.1   BIT MAPPED TEXT, BAR CODE, AND GRAPHIC FIELDS
The following is a list of bit mapped (ROM stored and Downloaded) field element mnemonics and their default values:

```
TSN,XB,YB,CC,TCI,CGN,FO,FJ,CMX,CMY,CS,TSP,,,,,AN
 1, 0, 0, *,  1, **, 0, 0,  1,  1, *,  1,,,,,, 0
```

    *   The default depends on the character generator (CGN) used.
    **   The default depends on the TCI used.

Note: All values must be positive integers.

TSN   **TEXT STRING NUMBER**
Determines from which text string the field obtains the data. This allows for more than one field to use the same text string. A TSN of 0 accesses the clock chip text string (see section 5.3.4). A TSN of 1 accesses the first line of data. A TSN of 2 accesses the second line of data, and so forth. Data is the text that follows a ^D2? command in a label layout. A graphic image field must point to a valid text string that contains at least 1 character. Maximum value is 65536.

XB   **X BEGINNING COORDINATE**
The X coordinate of the field is measured in dots. The far left edge of the label as viewed from the front of the printer is X coordinate 1. There is no X coordinate 0. The X coordinate increases in size from left to right (See Figure 9). An XB of 203 would place the text one inch from the left side of the label.

YB   **Y BEGINNING COORDINATE**
The Y coordinate of the field is measured in dots. A YB of 1 would be specified as the first edge of the label coming out of the front of the printer during a label print. The Y coordinate increases in size from the bottom to the top of the label (See Figure 9). A YB of 203 would place text one inch from the bottom of the label.

CC   **CHARACTER COUNT**
This parameter determines the number of characters that will be used in a field. If the number of characters in the selected text string is more than the quantity specified by CC, then the remainder of the text string is ignored. If the text string has less than the number of characters specified by this parameter, then only those characters defined by the text string are printed. For example, the text string - MICROCOM - would be 8 characters long. This parameter should be set to a value of 1 if the field is a graphic image.

TCI   TEXT CONVERSION IDENTIFIER
         This parameter determines what form the text string will be printed in. The following
         values define which text conversion method is used:

```
 1     Text (standard)
 2     Text Surrounded by Asterisks
 3     Text with UPC-A/UPC-E Checksum Digit Added
 8     Downloadable Fonts and Graphics
12     UPC-A Bar Code
13     UPC-E Bar Code (SEND 11 DIGITS)
14     UPC-E Bar Code (SEND 7 DIGITS)
15     Interleaved 2 of 5 Bar Code
16     Code 3 of 9 Bar Code
*17    Text with UPC-E Checksum and Extended Bars Added
20     EAN-13 Bar Code
21     EAN-8 Bar Code
*22    Text with EAN-13 Checksum and Extended Bars Added
*23    Text with EAN-8 Checksum and Extended Bars Added
24     MSI 1 (Plessey)
25     MSI 2 (Plessey)
26     MSI 3 (Plessey)
*28    Text with MSI Checksum Added - Type 1
*29    Text with MSI Checksum Added - Type 2
*32    Text with UPC-A Checksum and Extended Bars Added
*33    Text with UPC-A With Extended Bars Added
36     Postnet (Zip+4)
37     Postnet (Zip+6)
38     Maxicode Bar Code
40     Code 128 Bar Code (Automatic Compression)
41     Code 128 Bar Code (Manual Compression)
42     Codabar Bar Code
43     Code 93 Bar Code
44     AS-10 Bar Code
46     PDF417 Bar Code
50     UCC/EAN-128 Bar Code
51     Text with UCC/EAN-128 Information
```
* Refer to Section 7.1.1 on how to use these TCI's.

Example: For the string - **1234567**
A TCI of 1 would normally be used when printing regular text .
A TCI of 42 would print a Codabar bar code.

CGN   CHARACTER GENERATOR NUMBER

EMBEDDED FONTS
The following is a list of the character sets and specifications for the embedded fonts. When accessing downloaded fonts or graphics, this position is used to select which downloaded font or graphic to use. Valid slot numbers are 1 through 20.

Bitmapped Font Descriptions			
CGN	Point	Font Type	Sample
1	6	Swiss™ 721 Normal	6pt ABCDEFG1234567890abcdefghijklmnopqrstuvwxyz!@#$%^&*(
2	6	Swiss™ 721 Bold	**6pt ABCDEFG1234567890abcdefghijklmnopqrstuvwxyz!@#$%^&*(**
3	8	Swiss™ 721 Normal	8pt ABCDEFG1234567890abcdefghijklmnopqrstuv
4	8	Swiss™ 721 Bold	**8pt ABCDEFG1234567890abcdefghijklmnopqrstuv**
5	10	Swiss™ 721 Normal	10pt ABCDEFG1234567890abcdefg
6	12	Swiss™ 721 Normal	12pt ABCDEF123456789abcdef
7	14	Swiss™ 721 Normal	14pt ABCDE1234567abcde
8	18	Swiss™ 721 Normal	18pt ABCDE1234567
9	12	OCR-A	**ABCDEFG1234567890abcdefghij**
10	12	OCR-B	ABCDEFG1234567890abcdefghijklmn

Note: The Swiss™ 721 typeface is similar to Arial™.

Table 4

EMBEDDED BAR CODES

Many bar codes can be printed with various ratios and character spacing options. The following table illustrates these options. See Chapter 8 for more information on designing with bar codes.

Bar Code Symbologies					
Bar Code	CGN	Ratio	Height	Spacing	FO
Code 3 of 9	2 3 5 8	2:1 3:1 5:2 8:3	1 1 1 1	2 2 2 3	0123 0123 0123 0123
I 2 of 5	2 3 5	2:1 3:1 5:2	1 1 1	– – –	0123 0123 0123
UPC/EAN*	–	40%	1	–	0123
UPC Readable*	–	40%	1	–	0123
Code 128 & UCC/EAN-128*	–	40%	1	–	0123
Codabar	2 3 5	2:1 3:1 5:2	1 1 1	– – –	0123 0123 0123
Code 93	–	2:1	1	–	0123
AS-10	–	2:1	1	–	0123
MaxiCode (CGN=Mode)	2 3 4 5 6	– – – – –	– – – – –	– – – – –	0123 0123 0123 0123 0123
MSI (Plessy)	–	1:1	1	–	0123

Table 5

* These bar codes must be multiplied by 2 for a 80% ratio.

FO   FIELD ORIENTATION

This parameter defines the rotation of each field on the label. The point of rotation is determined from the field justification.

0   0 degrees (normal rotation).
1   180 degrees (upside-down rotation).
2   90 degrees (left rotation).
3   270 degrees (right rotation).

FJ   FIELD JUSTIFICATION
This parameter defines the justification of each field on the label.

0	Left justified above base-line.
1	Right justified above base-line.
2	Left justified below base-line.
3	Right justified below base-line.
4	Centered above base-line.
5	Centered below base-line.

Starting position definitions:

Table 6 shows how to obtain proper character placement relative to orientations and justifications.

Character Starting Positions Relative to Field Orientations and Field Justifications	
Rotation	Field Orientation and Justification
0,180 Degrees	0 - Left justified above base-line 1 - Right justified above base-line 2 - Left justified below base-line 3 - Right justified below base-line 4 - Centered above base-line 5 - Centered below base-line
90,270 Degrees	0 - Left justified above base-line 1 - Right justified above base-line 2 - Left justified below base-line 3 - Right justified below base-line 4 - Centered on Y axis, right of X coordinate 5 - Centered on Y axis, left of X coordinate

Character Starting Positions
Table 6

CMX   CHARACTER MULTIPLIER X DIRECTION
This parameter multiplies each character in the X direction. The valid range is 1 to 65536.

CMY   CHARACTER MULTIPLIER Y DIRECTION
This parameter multiplies each character in the Y direction. The valid range is 1 to 65536.

CS   CHARACTER SPACING
This parameter adjusts the spacing between each character. If this parameter is not used, then the default for the selected character generator (CGN) is used. The values (0-255) add dots and (256-512) subtract dots. For example, a value of 4 inserts 4 dots between characters and a value of 259 would subtract 4 dots between characters. Bar codes have default spacing according to the indicated multiplier. Multiplying a text

string will not multiply the spacing between characters. This element should be used to properly space the characters.

TSP   TEXT STARTING POSITION
This parameter marks the starting position of the character in the text string to be used as data. This is useful for allowing several fields to use sections of the same text string, minimizing the amount of data transmitted. For example, for the text string **0123456789**, A TSP of 5 and a CC (character count) of 2 would print **45**. See section 5.3.4 for use of this parameter with clock fields.

,,,,,   RESERVED SPACES

AN   ATTRIBUTE NUMBER
If this parameter is set to a value of 2, the character spacing will be fixed/non-proportional. A value of 0 is proportional (if available). Reversed text (white on black) is created by setting this value to 1 and printing a black box on top of the text. (Special note: The AN of the line field should also be set to a 1 for a reversed image.) A value of 3 will print both fixed/non-proportional character spacing and reversed text.

4.5.2   LINES

A line field is broken down into ten different parameters. The first position is a constant of 1. Next is the X starting coordinate followed by the Y. The next is a constant of 6 followed by three blank positions. The next two positions are the X size and Y size. Finally there is an attribute position. All fields defaulted must be separated by commas, and a carriage return must follow each graphics field definition.

The following is a list of line field mnemonics and their default values:

```
1,XB,YB,,6,,,,XS,YS,,,,,,,AN
1, 1, 1,,6,,,, 1, 1,,,,,,, 0
```

Note: All values must be positive integers.

1   CONSTANT FIELD
This value should be set to 1.

XB   X BEGINNING COORDINATE
The X coordinate of the field is measured in dots. The far left edge of the label as viewed from the front of the printer is X coordinate 1. There is no X coordinate 0. The X coordinate increases in size from left to right (see Figure 9). An XB of 203 would place the line one inch from the left side of the label. The valid range is limited to the print head width (832).

YB   Y BEGINNING COORDINATE
The Y coordinate of the field is measured in dots. A YB of one would be specified as the first edge of the label coming out of the front of the printer during a label print. The Y coordinate increases in size from the bottom to the top of the label (see Figure 9). A YB of 203 would place the line one inch from the bottom of the label. The valid range is 1 to 65536.

CONSTANT FIELD
This field is always defaulted.

CONSTANT FIELD
This field should be set to a value of 6.

CONSTANT FIELDS
The next 3 fields are always defaulted.

XS   X SIZE
The X size of the line. Valid range is 1 to 832.

YS   Y SIZE
The Y size of the line. Valid range is 1 to 65536.

CONSTANT FIELDS
The next 6 fields are always defaulted.

AN   ATTRIBUTE NUMBER
If set top a value of 1, the line will not reverse any text that is printed under it. A value of 0 will instruct the printer to reverse any field that is under it ("reverse video" or "white print on a black background"). (Note: The line field will only reverse text that has already been printed on the label. Therefore, to produce a reversed image, the line field MUST be printed AFTER the image field.)

MAKING LINES

Program sample: Lines
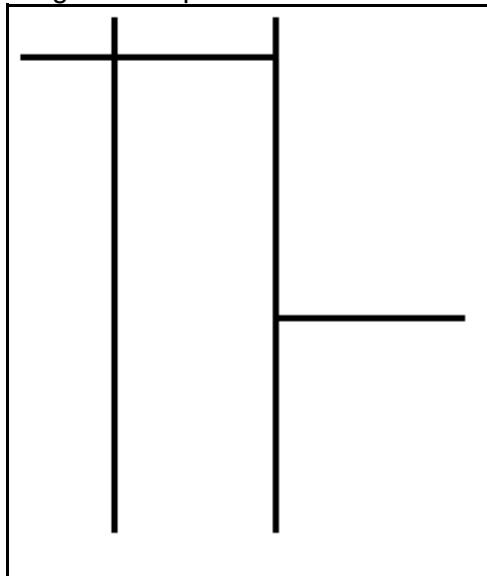

```
^D57?
4?
1,50,500,,6,,,,150,10?
1,100,50,,6,,,,10,500?
1,250,50,,6,,,,10,500?
1,250,250,,6,,,,150,10?
^D56?
^D2?
.?
^D3?
```

Lines
Figure 10

4.5.3   A SAMPLE SESSION (FIELDS)

Looking at the sample label...

^D57**?**	A label format is coming
5,812,1218,,20,35**?**	Header information
1,190,1068,8,1,8,,,2,2**?**	Field #1 information
2,139,900,11,1,8,,,2,2**?**	Field #2 information
3,117,760,26,1,8**?**	Field #3 information
4,265,560,11,1,8**?**	Field #4 information
4,123,50,11,16,3,,,3,406**?**	Field #5 information
^D56**?**	Select RAM Format
^D2**?**	Text Data is Coming
Microcom**?**	Text String #1
Corporation**?**	Text String #2
Thermal Printing Solutions**?**	Text String #3
01234567890**?**	Text String #4
^D3**?**	Print Label 1

... and referring to Field #1.

1,190,1068,8,1,8,,,2,2?

  1 - Field refers to text string #1 - **Microcom**. This field could have referred to
          Corporation, if it had a TSN of 2. The fields do not have to be in any kind of
          order with respect to the data fields.
190 - X beginning (XB) 190 dots from left edge of the print head.
1068 - Y beginning (YB) 40 dots from bottom of label.
  8 - Character Count (CC) of 8 characters, the amount of characters in **Microcom**.
  1 - A TCI of 1 indicates that the data will appear on the label as text, an ASCII
          string, as opposed to, for example, a bar code.
  8 - This CGN selection of 8 selects an 18pt font.
  ,,, - This will default the next two positions.
  2 - This sets the X multiplication to 2.
  2 - This sets the Y multiplication to 2.
  ? - A carriage return signals the end of this field.

The field parameters that were not defined will default. A FO and FJ of 0 will place EASY to
the right of the X coordinate with a rotation of 0 degrees. CMX and CMY will default to 1, so
the character will be the size as defined by the font. The TSN is 1, therefore the entire word
EASY will print (a TSN of 2 would have printed ASY). CLX and CLY will default to 5 and 7,
respectively, so a full character will be printed.

CHAPTER 5: PRINTER COMMANDS

The 466 printer has a large and versatile collection of control codes to meet the special needs of labeling applications. Most of the commands use a ^D control sequence, however the printer also recognizes a selected number of other control sequences.

For all the commands listed in this manual, the 466 will recognize either the one-character control character or the two-character caret and alpha character sequence. In other words, for a PC keyboard, the same command can be generated either by holding down the control key and pressing the letter or by entering two characters - the ^ (the character generated if you press the Shift key and the 6 key) and an alpha character (upper or lower case).

To protect against errors, in situations where two-character caret-alpha sequences are used exclusively as printer commands, control character recognition can be disabled. This is done either through software switch bank #1 (^D21) or command ^D93.

Some main-frame and mini-computers cannot use the ASCII '^' character. In these cases substitute the ASCII pipe symbol '|' or use the one character control-code representation.

The caret and pipe characters can be used in text or bar codes by entering them twice.

5.1   SPECIAL PRINTER CONTROL CODES

The following control characters perform special functions. All other control characters are ignored. Some of these instructions are also accessible through a ^D sequence.

^A   **Accumulator Mode:** Used to supply parameters for ^D commands.

^B   **Text entry mode:** Instructs the printer to enter printable text entry mode. This command (or the preferred ^D2?) must be sent before the text information. This command is equivalent to ^D2? but does not require a ? after it (^Btext_data string). Because control B is shorter it is easier to use in direct terminal mode. In general it is better to use ^D2 inside a file or program.

^C   **Print a label:** Starts the print cycle or batch. This command is equivalent to ^D3? but does not require a ? after it. Because control C is shorter than ^D3? it is easier to use in direct terminal mode. In general it is better to use ^D3? inside a file or program.

^D   **Command mode:** Used to issue commands to the printer. This command is normally preceded by a ^A sequence (see above). ^D commands must be terminated with a ? or another control sequence (^A9^D73^D3? equals ^A9^D73? and ^D3?.

^E   **Printer status request:** See section 5.2 for more details (equivalent to ^D5? but does not require a ? after it). Because control-E is shorter than ^D5? it is easier to use in direct terminal mode. In general it is better to use ^D5? inside a file or program.

^M   **Terminate text or data string:** Must be used to terminate a text or data string. (Same as a carriage return or enter key on a PC keyboard.)

---

^H   (**DEL**) **Deletes the last printable character entered:** This is usually only used when communicating to the***** printer through the keyboard. (Same as the backspace key on a PC keyboard.)

^K   **Print test label:** A test label consists of a series of diagonal lines. It is useful in determining the condition of the dots on the print head (equivalent to ^D11?).

^L   **Form Feed.** (Equivalent to ^D12)

^Q   **XON:** Instructs the printer to continue sending data.

^S   **XOFF:** Instructs the printer to stop sending data.

5.2   PRINTER STATUS MESSAGES

The 466 printer is capable of returning three different types of status messages depending on how the machine is configured (see software dip switch #1, ^D21, section 5.3). The text equivalent setting returns a descriptive word or phrase. The "^" or caret setting returns an ASCII '^' character followed by the defining alpha character. The "control-code" setting returns an actual control code.

The printer will send to the host one of the following messages in response to a ^E or ^D5:

Status Messages		
TEXT	^ALPHA or CTRL CODE	DEFINITION
>READY<	^F	Normal condition
>CUTTER ERROR<	^G	Cutter cannot rotate
>STACKER ERROR<	^H	Stacker error or full
>TAKE-UP FULL<	^I	Internal rewinder is full
>RIBBON BROKE<	^K	Printer is out of ribbon
>HEAD IS UP<	^L	Print head is raised
>PRINTER PAUSED<	^P	Printer is paused
>DATA ERROR<	^U	Communication error
>TAKE LABEL<	^V	Printer is waiting for a label to be taken
>ADD RIBBON<	^X	Format requires ribbon and ribbon is out
>LOW STOCK<	^Y	Out of paper
>RESTARTED<	^Z	Printer has been reset
>OVER VDD<	^^	Head voltage is out of range
>REMOVE RIBBON<	^_	Format requires no ribbon and ribbon is loaded

Table 7

5.3   SENDING ^D PRINTER COMMANDS

Unless other-wise specified, these commands are entered by sending a ^DXX where XX is the command number. It is followed by a carriage return or another control code. Some commands

load data or control numbers and are preceded by a ^AXX, where XX represents the data or control number. Unless otherwise specified, command codes should precede or follow the actual format layout. They should be placed before the ^D57 or just before the print command ^D3.

Commands not listed in 5.3.1 (the dip switches and non-volatile commands section) are not retained when the printer is turned off and if desired, must be sent again upon power-up.

When possible, the following commands are grouped by function. See the quick reference command summary in Appendix B for a listing by number.

Some commands can be substituted with equivalent control-codes. If this is the case, there will be an equivalence statement in the description.

Example of Command usage:
^A3^D75^D3**?** (This sequence will print a batch of three labels).

5.3.1   SOFTWARE SWITCHES AND NON-VOLATILE COMMANDS
The following commands are different from the other printer commands in that they are stored in non-volatile memory and configure the machine upon power-up. Once sent to the printer, they do not need to be sent again.

The following commands are loaded on power-up. Although they can be set, they will not be used until the printer has been restarted. **The printer will not use these settings until this is done.**

<u>^A</u>   <u>^D</u>   <u>COMMAND</u>

21   Change SW1: Change software switch bank #1. The software switch banks use a ^AB sequence followed by an 8 digit 0 or 1 code.

For example: ^AB10100001^D21**?** selects text equivalent response, accept control codes, disable echo, and enable XON/XOFF flow control.

```
        12345678
^ABxxxxxxxx
    *******.) 1=XON/XOFF Enable, 0=Disable (COM1)
    ******.)) 1=Send Status Message on Error (COM1)
    *****.))) 1=Echo Enable, 0=Disable (COM1)
    ****.)))) 1=Send Status Message on Error (COM2)
    ***.))))) Always 0
    **.)))))) 1=Ignore Control Codes, 0=Accept (COM1,COM2
    **        and LPT1)
    *.))))))))))),
    .)))))))))),* Status Message Format (COM1 and COM2)
                 00 = Control Codes
                 10 = Text Equivalent
                 11 = ^ Equivalent
```

<u>Position:</u>

1,2   Status Message Format (COM1 and COM2): This determines what the printer will send back in response to an enquiry. See Section 5.2.

3   Control Codes (COM1, COM2 and LPT1): This switch setting will allow or disallow printer response to control codes (below 20h).

4   Not Used

5   Send Status Message on Error: If this switch is enabled and a printer error occurs, the printer will send the corresponding error message to the host via COM2. Please refer to the ^D5 command for more information about status messages.

6   Echo (COM1): If this feature is enabled, the printer will echo all received characters to the serial port.

7   Send Status Message on Error: If this switch is enabled and a printer error occurs, the printer will send the corresponding error message to the host via COM1. Please refer to the ^D5 command for more information about status messages.

8   XON/XOFF (COM1): Enable or disable XON/XOFF software handshaking. CTS/RTS hardware handshaking is always enabled.

<u>^A</u>   <u>^D</u>   <u>COMMAND</u>
22   **Change SW2:** Change software switch bank #2.

```
        12345678
^ABxxxxxxxx
   *******.)))),
   ******.)))),*
   *****.)))),**
   *****      *** Power-up Label Format
   *****      000=Power-up Format Disabled
   *****      001=ROM or Saved Format File 1
   *****      010=ROM or Saved Format File 2
   *****      011=ROM or Saved Format File 3
   *****      100=ROM or Saved Format File 4
   *****      101=ROM or Saved Format File 5
   *****      110=ROM or Saved Format File 6
   *****      111=ROM or Saved Format File 7
   ****.)))))) 1=Use Saved Format File, 0=Rom Format
   ***.))))))) 1=Print Button Enable, 0=Disable
   **.)))))))) 1=Line Feed Button Disable, 0=Enable
   *.))))))))) 1=>RESTARTED< Message Enable, 0=Disable
   .)))))))))) 1=Clear Text Enable, 0=Disable
```

<u>Position:</u>
1   **Clear Text Function:** If enabled, all variable text strings will be erased when a ^D2? is processed.
2   **>RESTARTED< Message:** If the printer has been reset and this switch has been enabled, the printer will respond with to the first status request by sending the >RESTARTED< message. If additional enquiries are made the printer will respond normally. The >RESTARTED< message is only sent once after reset.
3   **Line Feed Button:** If disabled, the line feed button will not feed paper when pressed. The button can still be used for "Top of Form" if the TOF button function is enabled in soft switch bank #3 (^D23).
4   **Print Button:** If this is 0, the button can be used for paper feed, but cannot be used to initiate label printing.
5   **Power-up Format Type:** Defines the power-up label format. This parameter determines whether to use a saved format file for the power-up label, or a ROM format (defined by positions 6, 7, and 8). The saved format file must be battery backed to use the saved format file feature. See Appendix B for configuration instructions and section 5.3.7 for saved format file information. Please consult your service organization if changes or additions to the fixed ROM formats are required.
6,7,8   **Power-up Label Format:** These switches are used in conjunction with switch 5 above. They determine which stored format is loaded at power-up. The printer can be instructed not to load a format at power-up by setting all three switches to 0. (Please note: The printer will not print unless a valid format has been loaded. A format may be loaded by using these switches to automatically load a previously stored format or by simply sending non-stored format to the printer.)

^A **^D** **COMMAND**

   23 **Change SW3:** Change software switch bank #3.

```
          12345678
^ABxxxxxxxx
   *******. Detect Black Line on Power-up (transmissive)
   ******.) Detect Black Line on Power-up (reflective)
   *****.)) 1=Enable TOF button, 0=Disable
   ****.))) 1=Enable TOF at Power-up, 0=Disable
   ***.)))) Always 0
   **.))))) 1=Status after Print (COM1 & 2), 0=No Response
   *.)))))) 1=Disable Extended ASCII, 0=Enable (COM2)
   .))))))) 1=Disable Extended ASCII, 0=Enable (COM1)
```

Position:

   1 **Extended ASCII (COM1): If enabled, characters over 7F hex will be processed.**

   2 **Extended ASCII (COM2): If enabled, characters over 7F hex will be processed.**

   3 **Status after Print (COM1 and COM2):** If enabled, a status message will be sent to the host via COM1 and COM2 after each print cycle. Please refer to the ^D5 command for more information about status messages.

   4 **Always 0**

   5 **Enable TOF at Power-up:** If enabled, the printer will realign the media to "Top of Form" at power-up. The LTS sensor must be installed for proper operation.

   6 **Enable TOF Button:** If enabled, tapping the line feed button will instruct the printer to realign the media to "Top of Form". The LTS sensor must be installed for proper operation. Normal line feed operation is maintained and is activated by pressing and holding the line feed button. Line feed operation may be disabled in switch bank 2 (^D22).

   7 **Detect Black Line at Power-up:** If this switch is enabled, the printer will automatically run a few labels and correctly set the ^D91 value using the optional reflective sensor.

   8 **Detect Black Line at Power-up:** If this switch is enabled, the printer will automatically run a few labels and correctly set the ^D91 value using the transmissive sensor.

^A   **^D**   **COMMAND**
      24   **Change SW4:** Change software switch bank #4.

```
12345678
^ABxxxxxxxx
  *******.)))))),
  ******.)))))),*
  *****.)))))),**
  ****.)))))),***
  ****        0000 = Not decoded (8 bit)
  ****        0001 = Danish (7 bit)
  ****        0010 = 860 (8 bit)
  ****        0011 = Spanish (7 bit)
  ****        0100 = 850 (8 bit)
  ****        0101 = German (7 bit)
  ****        0110 = 865 (8 bit)
  ****        0111 = Swiss (7 bit)
  ****        1000 = 852 (8 bit)
  ****        1001 = French (7 bit)
  ****        1010 = 863 (8 bit)
  ****        1011 = Swedish (7 bit)
  ****        1100 = 437 (8 bit)
  ****        1101 = Italian (7 bit)
  ****        1110 = British (7 bit)
  ****        1111 = US English (7 bit)
  ****
  ***.)))))) 1=Auto-size on Power-up, 0=Disable
  **.))))))) 1=Blow-hole Sensing Enable, 0=Disable
  *.)))))))) Always 0
  .))))))))) 1=Enable Slashed Zeros, 0=Disable
```

Position:
    1   **Slashed Zeros:** If enabled, the printer will print the zero character with a slash.
    2   **Always 0**
    3   **Blow-hole Stock:** Enable this position when using blow-hole or cut-slot stock: Stock that uses a hole instead of a gap to separate labels.
    4   **Auto-size on power-up:** When enabled, the printer automatically sizes the label stock when turned on. The printer then uses these header values for all subsequent label formats. See the ^D39 command in section 5.3 for more information on auto-sizing.
    5   **Code Page Selection**
    6   **Code Page Selection**
    7   **Code Page Selection**
    8   **Code Page Selection**

^A   **^D**   **COMMAND**
25   **Change SW5:** Change software switch bank #5.

```
     12345678
^ABxxxxxxxx
   *******.) 1=XON/XOFF Enable, 0=Disable (COM2)
   ******.)) 1=8 Data Bits, 0=7 Data Bits (COM2)
   *****.))) 1=Echo Enable, 0=Disable (COM2)
   ****.)))) 1=No Parity, 0=Enable Parity (COM2)
   ***.))))) 1=Odd Parity, 0=Even Parity (COM2)
   **.)))))) 1=Ignore Control Codes, 0=Accept (COM2)
   *.)))))))))),
   .)))))))))),* Status Message Format (COM2)
                00 = Control Codes
                10 = Text Equivalent
                11 = ^ Equivalent
```

Position:
1,2   **Status Message Format (COM2):** This determines what the printer will send back in response to an enquiry. See Section 5.2.
3   **Control Codes (COM2):** This switch setting will allow or disallow printer response to control codes (below 20h).
4   **Parity (COM2):** Selects either even or odd parity error checking.
5   **Enable Parity (COM2):** Enables or disables parity error checking.
6   **Echo (COM2):** If this feature is enabled, the printer will echo all received characters to the serial port.
7   **Data Bits (COM2):** Choose 7 or 8 bit data.
8   **XON/XOFF (COM2):** Enable or disable XON/XOFF software handshaking. CTS/RTS hardware handshaking is always enabled.

^A   ^D   COMMAND
         26   Change SW6: Change software switch bank #6.

```
        12345678
^ABxxxxxxxx
   *******. 1=Disable ON/OFF LINE Button, 0=Enable
   ******.) Not Used
   *****.)) Not Used
   ****.))) 1=Stacker Enable, 0=Disable
   ***.)))) 1=Enable Cutter at Power-up, 0=Disable
   **.))))) 0=Cutter Type A, 1=Cutter Type B
   *.)))))) 1=Use > and # for C128 commands, 0=Use #
   .))))))) 1=Enable Slew Speed, 0=Disable
```

Position:
         1   Slew Speed Control: If enabled, the printer will rapidly advance to the end of the label after all printing is completed. Slew speed is 12ips in direct thermal mode and 8ips in thermal transfer mode.
         2   Code 128 Command Characters: If enabled, the printer will use the > and # characters as Code 128 command characters. If disabled, the printer will only use the # character.
         3   Cutter Type Select: If enabled, the printer will assume cutter type B (guillotine). If disabled, the printer will assume cutter type A (rotary).
         4   Cutter Status at Power-up: If enabled, the cutter will be active at power-up. If disabled, the cutter must be enabled using the ^D99 command.
         5   Stacker Status: This switch enables the optional stacker mechanism.
         6   Not Used:
         7   Not Used:
         8   Disable ON/OFF LINE Button: If this switch is enabled, the ON/OFF LINE Button will no longer function.

^A   ^D   COMMAND
XX   36   Adjust Contrast Base: This command is used to adjust print contrast base. This command is stored in the EEPROM and skews the entire contrast window (^D35). This command has a range of 10 to 200%.

5.3.2 PRINTING COMMANDS

The following commands initiate label printing or define the number of labels to be printed.

^A	**^D**	**Command**
	3	**Print Command:** Prints a single label or starts the printing of a batch of labels. This is usually the last command in a format file.
	11	**Print Test:** Prints a label with diagonal lines that is useful in determining the condition of wear of the print head. (Equivalent to ^K)
	12	**Form Feed:** (Equivalent to ^L) Prints a blank label.
	70	**Clear commands 73-76.**
XX	73	**Load copies count:** This command instructs the printer to print multiple copies without regenerating the label image. This command can be used in conjunction with the ^D75 (load print count) to allow duplicate copies to be made inside a batch. For example, assume a format has been loaded that has an incrementing field. The following command string will print a total of 150 labels; three identical copies of each serial number and 50 sets of each number (^A3^D73^A50^D75^D3?).
1	74	**Infinity Print:** Prints a batch of labels but will continue to print until the printer is turned off. This command is most useful in tag/tear or peel-and-dispense modes. ^A1 activates this mode. Can be used with serial numbers. Example usage: ^A1^D74^D3**?** - Prints until printer turned off or paused, using the front panel button.
XX	75	**Load Label Count:** This command instructs the printer to print a batch of labels. This command differs from the ^D73 command by regenerating the label for every print. This allows the printer to increment or decrement fields on each label. It can be used in conjunction with the load copies count command (^D73). The batch of labels will be printed when a ^D3 is executed. Therefore, this command must precede a ^D3 command. See section 5.3 for more information. Example usage: ^A20^D74^D3**?** - This example will regenerate and print 20 labels.

^A	**^D**	**COMMAND**
XXX	**76**	**Load Delay Time Between Printed Labels:** Delays the printing between labels in a batch. Preceded by ^A which contains the wait in 1/10ths of a second increments. The maximum value is 650. Example usage: ^A10^D76**?** - introduces a one second delay between printed labels.

5.3.3 AUTO-SIZING AND VALID GAP COMMANDS

The auto-size feature gives important format file values for the label header. These values are:

LSY -	Label height
GAP -	Distance between labels
AGD -	Steps until activating gap detector
SPG -	Steps past gap
^D91Value -	Sets gap detection level. See ^D91 definition later in this section. This value may be obtained using the auto-size command. This should be done whenever the media type is changed.

When auto-size is executed, a sample of approximately 5-10 labels will run through the printer. The printer averages the values it receives from these labels.

To auto-size labels that use a black line instead of a gap, first execute a ^A1^D47**?** to put the unit in black line mode.

To auto-size blow-hole stock, set software dip switch 4 for blow-hole stock (see section 5.3.1) and then auto-size.

There is also a power-up auto-size feature as defined in section 5.3.3, ^D24.

^A	**^D**	**Command**
	39	**Auto-Size Label:**

0   Clears the use of auto-size values set by ^A1^D39.

1   Uses the values obtained for the variables above instead of what the user supplies in the header of the file format. This will not display the variables on the screen.

2   Automatically sizes a label and sends the values obtained to the serial communications port. The returned values may then be used to construct a correct label header.

3   Same as ^A2^D39, but the values are printed on the label being checked instead.

               (Note: The LCB should be set to 1 before auto-sizing black line stock. ^A1^D47?)

XX   **91**   **Gap Threshold Value:** This value can be obtained and set using the auto-size (^D39) command. It must be properly set in order for the printer to determine when a gap or other sense mark is present. When used with the standard transmissive sensor which measures the amount of light which passes through the media, this value represents a point between 0 (no light passing through) and 240+ (all light passing through) where the printer will assume that a valid gap has occurred. The ^D91 command should be placed at the beginning of every label definition file when multiple label types are used. Placing the command in every file will prevent skipping or other registration errors that may occur when using media which has different opacity values. This command is stored in non-volatile memory and is therefore loaded whenever the printer is powered on. The factory default value is 92.

5.3.4   REAL-TIME CLOCK

^A   ^D   Command
      30   Change Clock: Use the sequence below to set the time and date of the optional real-time socket:

          ^D30?
          HH:MM:SS?
          DD/MM/YY/W?

HH = hours (24 hour format)	**MM** = month
MM = minutes	**DD** = day of month
SS = seconds	**YY** = last 2 digits of year

          W = day of the week
                1 = SUN
                2 = MON
                3 = TUE
                4 = WED
                5 = THR
                6 = FRI
                7 = SAT

The optional clock produces a string of text that is accessed through use of a TSN of 0 (See Table 8 for definitions of field parameters).

The text string is shown below...

          HH:MM:SS MM/DD/YY XXX DD/MM/YY XXX

...where xxx is the day of the week.

These values should be inserted into the Field parameters for proper clock text access:

Clock Field Parameters			
TSN	TSP	CC	TEXT
0	1	8	HH:MM:SS
0	10	8	MM/DD/YY
0	19	3	Day of Week
0	23	8	DD/MM/YY
0	32	3	Day of Week

Table 8

^A   ^D   Command
      31   Show Clock: This command will send the date and time to the serial port.

Sample formats using the clock function:

^D57**?**
3**?**
0,410,100,12,16,2,,4,2,60,2,23**?**
0,410,25,12,1,5,,4,,,,23**?**
1,410,200,20,1,5,,4**?**
^D56**?**
^D2**?**
EUROPEAN DATE FORMAT**?**
^D3**?**

European Date Format
Figure 11

^D57**?**
3**?**
0,410,100,12,16,2,,4,2,60,2,10**?**
0,410,25,12,1,5,,4,,,,10**?**
1,410,200,20,1,5,,4**?**
^D56**?**
^D2**?**
US DATE FORMAT**?**
^D3**?**
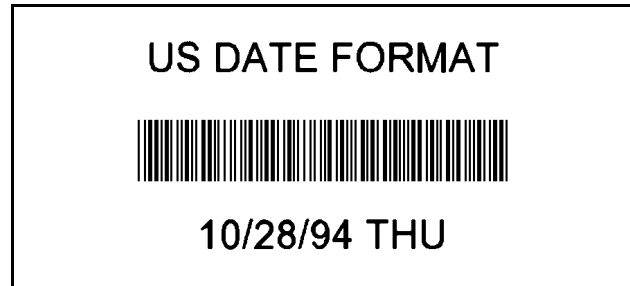
US Date Format
Figure 12

^D57**?**
2**?**
0,410,25,34,1,5,,4**?**
1,410,100,22,1,5,,4**?**
^D56**?**
^D2**?**
UNMODIFIED DATE STRING**?**
^D3**?**
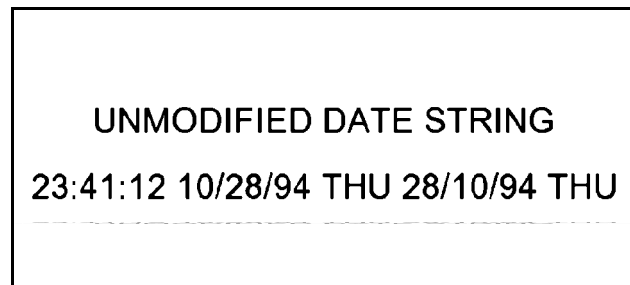
Unmodified Date Format
Figure 13

5.3.5   SERIAL NUMBER COMMANDS

The following commands, ^D80 through ^D89, refer to the serial number function of the 466 printer. The 466 can increment or decrement any single serial number on the label by any amount. However, if there is more than one serial number on the label, then all serial number fields can only increment or decrement by one. Single and multiple serial commands cannot be implemented on the same label. Please note that the ^D57 command will clear most of the serial number commands. Therefore, all serial number commands should be placed either after the ^D56 command, or just before the print command ^D3.

The following two commands are valid for both serial number functions:

<u>^A</u> <u>^D</u>   <u>Command</u>
      80   Clears Commands 86, 88, 89.

      81   **Disable Serial Number Function:** Will disable either single or multiple serial number commands.

The next three commands should be used when a single data string must be incremented or decremented by a value other than 1. Only one field per label format may increment or decrement by a value other than 1.

XX   **84**   **Load Text String Number to increment/decrement:** Tells the printer which text string number to increment or decrement. See section 4.4 on text string numbers. The ^A value states which string is adjusted.

XX   **85**   **Load increment/decrement step value:** This is the value that the single serial number is incremented or decremented. ^A specifies the step value.

      86   **Single Serial Number Status:**
0   Disable increment and decrement.
1   Enable increment. The serial number will be incremented by the value from ^D85.
2   Enable Decrement. The serial number will be decremented by the value from ^D85.

The next three commands should be used when incrementing or decrementing by a value of 1. These commands allow multiple fields to be incremented or decremented individually.

XX   **87**   **Load Field Number to Clear Increment/Decrement status:** Clear the status of one or more serial numbers with this command. Example: ^A1^D87 will command the printer not to increment/decrement field number one anymore.

XX   **88**   **Load Field Number to Increment by 1:** ^A specifies the field.

XX   **89**   **Load Field Number to Decrement by 1**: ^A specifies the field.

^A	**^D**	**Command**
XX	**75**	**Load Label Count:** Tells the printer to print a batch of labels using the serial number function if enabled. Can be used in conjunction with load copies count (^D73, see section 5.3). The batch of labels will be printed when a ^D3 is executed. Therefore, this must precede a ^D3 command. The only difference between this command and ^D73 is in the ability of this command to increment and decrement serial numbers in the batch.

A sample program using the single serial number feature:

```
^D57?
1?
1,416,25,2,1,6?
^D56?
^A2^D86?
^A1^D84?
^A5^D85?
^A3^D75?
^D2?
20?
^D3?
```

A sample program using the multiple serial number feature:

```
^D57?
3?
1,400,25,4,1,6?
2,100,75,4,1,6?
3,100,125,4,1,6?
^D56?
^A2^D88?
^A1^D88?
^A3^D89?
^A3^D75?
^D2?
100?
200?
300?
^D3?
```

5.3.6 SAVING FORMAT COMMANDS

The printer has the capability to store up to 128 label formats in printer memory. Once stored, these files may be loaded quickly from memory without the need to transfer them over the external communications ports. If the battery backup option is installed, the printer will retain these files when the printer is powered off. The printer can be configured through software switch bank 2 (^D22 command), to automatically process the file at power-up.

The maximum number of stored files depends on the size of the files and the amount of memory installed in the printer. The standard 1M RAM configuration offers approximately 700K of format storage area .

^A	^D	Command
XX	54	**Send Saved Format File to Serial Port:** ^A selects which one (1-128).
XX	58	**Process Saved Format:** ^A selects which user entered format (1-128) is to be printed.
XX	59	**Save Format File:** ^A selects which slot (1-128) in which the user entered format is to be placed. The format file must be terminated by an ESC (1B hex) character.
	100	**Clear User RAM:** This command will clear all downloaded fonts, graphics, and stored label formats. This command must be issued before saving label formats or when saved label designs need to be changed. There is no way to erase or change a single slot.

USAGE:

Before sending the first downloadable label format, graphic, or font, the user RAM must be cleared by sending ^D100**?**. When this command is issued, all previously saved files will be erased. Only use this command before sending the first file or when a total user RAM clear is required.

Next send the ^A1^D59**?** command sequence followed by the label format and an escape character (1B hex or ^[). (The ^A1 value indicates that file #1 of a possible 128 is being sent to the printer. The escape character indicates the end of the file save.)

To access the stored file, send ^A1^D58**?**, where ^A1 indicates the number of the file that is accessed. The printer will now process the stored file.

Additional files may be stored using the procedure mentioned above. Use the ^AX^D59 command, where X denotes the next available storage location.

To list a file that has previously been sent to the printer, use the ^AX^D54 command, where ^AX denotes the file to be read. The printer will send the file to the serial port.

Sample files: File #1 initializes user memory and downloads label format #1. File #1 includes all the fixed data on the label. File #2 is the file that initiates processing of file #1 and includes all variable data for the format. File #2 also prints the label. File #3 shows how a second saved format would look if the entire format was in one file.

NOTE: <ESC> = 1B hex or ^[

File #1
^D100**?**   ;Erase all previously stored files.

^A1^D59**?**   ;Load the following data to slot #1
^D57**?**   ;Start label definition
4,288,193,5,19,30,0,1,148**?**
1,100,20,10,1,10,0,2,1,1,,1**?**
1,210,20,7,1,10,0,2,2,2,,11**?**
1,152,154,12,12,,0,2,2,100,,18**?**
1,130,54,12,32,,0,2,2,2,,18**?**
^D56**?**   ;End label definition
^D2**?**   ;Start text entry mode
<ESC>   ;End save

File #2
^A1^D58**?**   ;Recall slot #1 data
24 PRINTS $ 3.79 20496340379**?**   ;(^D2 was include in File #1)
^D3**?**   ;Print

File #3
^A2^D59**?**   ;Load the following data to slot #2
^D57**?**   ;Start label definition
4,620,161,,18,35,,73,3**?**
1,120,110,50,1,11**?**
2,120, 80,70,1,10**?**
3,120, 60,70,1,10**?**
4,120, 40,70,1,10**?**
^D56**?**   ;End label definition
^D2**?**   ;Start text entry mode
MICROCOM CORPORATION**?**
8220 GREEN MEADOWS DR., N.**?**
LEWIS CENTER, OH 43035**?**
(740) 548-6262**?**
<ESC>   ;End save

The above file would be selected by sending an ^A2^D58**?**.

5.3.7   LABEL PRESENT SENSOR CONTROL
The optional label present sensor gives the printer the ability to print at the operators pace. The following modes define its operation.

^A	^D	Command
XX	**96**	**Load Advance Delay:** ^A specifies how many milliseconds to delay repositioning of the label in tag/tear and peel-and-dispense modes. Example usage: ^A1000^D96 would delay label advance by one second.
	97	**Tag/Tear Operation:** A method of dispensing a label where the label is advanced so the perforation between labels is on the tear bar. This allows heavy tag stock and regular label stock to be torn off easier. The distance of advancement may also be defined by the user, if used in conjunction with the ^D95 command. There are three modes of operation:
0		Disable tag/tear operation.
1		Advance after every label: Causes the paper to be advanced to the perforation after every label is printed. As soon as the label is taken, the paper is backed up to the beginning of the next label. This mode forces the printer and computer to operate at the speed of the operator.
2		Advance after copies count: Causes the paper to be advanced to the perforation after the number of labels specified by the copy count (^D73) or label count (^D75) commands have been printed. As soon as the labels are taken, the paper is backed up to the beginning of the next label.
3		Advance when idle: This causes the paper to be advanced to the perforation whenever the printer does not have a label request pending. When another label request is made, the paper backs up and the next label is printed.
	98	**Peel-and-Dispense Mode:** A method of dispensing a label, where the backing paper is automatically peeled away from the label. It allows the operator to take the label and apply it without having to peel the label from the backing paper. The printer will advance the label so that it is hanging off the tear bar. Once the label is taken, the printer will back the paper into the printer so as not to waste label stock. Larger labels may require the use of a front label support rack. The peel position can be adjusted using the ^D95 command. (See section 2.5.2 for Peel-and-Dispense loading instructions.)
0		Turn off peel and dispense mode with ^D98.
1		Turn on peel and dispense mode.
2		(Custom Applicator Mode - peel and dispense without delay.)

^A	**^D**	**Command**
XX	**95**	**Load User Defined Steps for Label to Advance:** Used in conjunction with tag/tear, peel-and-dispense and cutter mode. This value will advance the label after a print, a user defined distance. While the user may specify 64,000 steps, it is not recommended that the number of steps create a situation where the entire label is back fed into the printer. This command has a default value of XXX.

5.3.8   TEXT STRINGS COMMANDS

The following commands support special editing features that allows the positioning of new text, protects existing text, and enters text without using the ^D2**?** or ^B delimiter. These commands are generally used when there is a format already loaded in RAM. They are used to edit that file in order to print variations, often only the text in one field.

^A	**^D**	**Command**
	60	**Clears command 61**
XX	**61**	**Mark Text Starting Position:** ^A designates which text field to start entering new data. This is useful for creating variable data fields after a string of fixed data fields. ^AXX^D61**?** marks the text starting position, where XX is the text string number where the new text will begin. If XX is a 2, the first line of new text entered following a ^D2**?** will overwrite text line two. If two new text strings are entered, the existing text lines two and three will be over-written. If three new text strings are entered, the existing lines two, three and four will be overwritten, and so forth.
	62	**Pre-padded Text:** This command is sent after text that is to appear at the beginning of each field. Text sent after this command will be appended to the pre-padded text. This is useful, for example, if the first two numbers of a bar code are always constant and only the new bar code numbers need to be sent. The printer would automatically update the new bar code with the two fixed numbers. A ^D62 prevents existing text lines from being over-written. Any new text entered after a ^D62**?** will be appended to the existing lines.
	63	**Text Mode Control:** Allows entry of new text without a ^D2 and/or clears all text when new text is added. The following ^AXX values have the following effects:

0	Disable 1 & 2.
1	Enable auto-print mode: New text entered after this command are recognized as text lines and will overwrite existing text. The ^D2**?** is not needed at the beginning of new text.
2	Clear all previous text upon receiving new data. When one or more characters of new text is entered, the existing text area will be erased in its entirety. The printer can be programmed to enter this mode automatically upon power-up by setting position 7 of software dip switch 2 (See ^D21, section 5.3.1).
3	Enable 1 & 2.

^A	**^D**	**Command**

XX   64   Auto Print String Count: ^A tells the printer how many text strings to accept before printing. Used in conjunction with ^A1^D63.

When the printer is put in auto-print mode, it is not necessary to send a ^D2**?** to inform the printer that text is coming or send a ^D3**?** to tell the printer to print a label. The printer will accept all incoming data as text strings (except control codes) and will print a label as soon as the number of strings equals the amount specified by the ^D64 command. At this point, the printer will print a label and continue to accept data. This mode is useful for interfacing to a device that transmits raw data, such as a scale or meter.

This is an example of the D63, 64 and 65 Commands...

```
^A0^D64?                                      ;clear any old settings
^D57?                                         ;load new format mode
11,832,640,,20,36?                            ;header
1,47,463,10,1,2?                              ;field info
2,416,439,20,1,3,,4?                          ;field info
3,416,412,25,1,3,,4?                          ;field info
4,416,385,25,1,3,,4?                          ;field info
5,47,350,10,1,2?                              ;field info
6,307,503,30,1,3?                             ;field info
7,60,207,29,1,5?                              ;field info
7,416,277,20,16,2,,4,2,50,2?                  ;field info
8,60,149,29,1,5?                              ;field info
9,60,090,29,1,5?                              ;field info
10,60,031,29,1,5?                             ;field info
^D56?                                         ;select RAM format
^D2?                                          ;begin text entry mode
SHIP FROM:?                                   ;data line 01 (protected)
MICROCOM CORPORATION?                         ;data line 02 (protected)
8220 GREEN MEADOWS DR., N.?                   ;data line 03 (protected)
LEWIS CENTER, OH 43035?                       ;data line 04 (protected)
SHIP TO:?                                     ;data line 05 (protected)
            Order No:     XXX?                ;data line 06
777777777777777777777777777777777777777?     ;data line 07
8888888888888888888888888888888888888888?    ;data line 08
9999999999999999999999999999999999999999?    ;data line 09
AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA?     ;data line 10
^A3^D63?                                      ;enable auto print and clear text
^A5^D64?                                      ;tell printer to print after 6 (CR)
^A6^D61?                                      ;tell printer to start new data entry
                                               at data line 6 instead of 1
```

CHAPTER 6: DOWNLOADABLE GRAPHIC IMAGES

The 466 printer has 255 slots available for storing fonts or graphics. Existing graphic images can be converted to the proper format using either the "PCX2MIC.EXE" or "BMP2MIC.EXE" software utilities. The graphic image format sections are provided to support developers that wish to create 466 graphic files from within their own applications.

6.1   USING THE GRAPHICS CONVERSION UTILITIES

The following section details the process required to convert and download graphics. The conversion utilities may be downloaded at http://www.microcomcorp.com. These 16 bit DOS utilities convert PCX or BMP type graphic images to a format suitable for downloading to the 466 printer.

6.1.1   PCX2MIC.EXE PROGRAM

A) Run the program - PCX2MIC
B) Follow the on screen instructions and note the slot # the image was placed in.
C) Make sure the slot is clear. Printer memory can be cleared using the ^D100 command.
D) Download resulting file (filename.N66 or .R66) file to printer
E) Section 4.5.3 explains how to access loaded images.

6.1.2   BMP2MIC.EXE PROGRAM

A) Run the program - BMP2MIC
B) Follow the on screen instructions and note the slot # the image was placed in.
C) Make sure the slot is clear. Printer memory can be cleared using the ^D100 command.
D) Download resulting file (filename.N66 or .R66) file to printer
E) Section 4.5.3 explains how to access loaded images.

6.2   GRAPHIC IMAGE DOWNLOAD METHODS

The model 466 supports compressed and uncompressed graphic image and font downloads. The compressed format (^D107) shortens download time by reducing the number of bytes sent to the printer. Please note that the compressed format is only usable on 8 bit data connections and will not function using a 7 bit connection. The uncompressed format (^D106) is usable on 7 or 8 bit data connections. The ^D106 method is more flexible but it encodes the image data using ASCII-HEX. This results in a much larger file size. Microcom Corporation recommends using the compressed format when possible.

6.2.1 COMPRESSED BINARY IMAGE COMMAND (^D107)

This command allows graphic images or fonts to be transmitted in binary, thereby cutting the number of bytes sent in half. Furthermore, this command allows for data compression by converting strings of 0h or FFh bytes to shorter byte-plus-count sequences. These sequences are expanded to the proper number of bytes within the printer. This command is only useable on data connections that support 8-bit data such as a serial port configured for 8 data bits and no parity, or a parallel port. This command will not function correctly with a serial port configured to 7 data bits.

The following is the format of ^D107 command when used with a graphic image file.

^A *<slot number>* ^D107?

<rotation> <count> <image data>

<u>Where:</u>
<slot number> is a slot number, 1 through 255 (in ASCII). Note: The 466 uses the same TCI for fonts and graphics. They are both accessed by using a TCI of 8. Therefore a font and a graphic cannot have the same CGN number.

<rotation> is an 8-bit integer, 0 for an upright font and 1 for a 90-degree rotated image.

<count> is a 32-bit integer, least significant byte first. This is number of uncompressed bytes that the image uses, **not the number of bytes that will actually be transmitted.** Due to compression, the number of bytes transmitted will normally be less than this number.

<image data> is the compressed binary image. Refer to section 6.3 for a detailed description of this data.

Compression Algorithm
The binary data that make up the image file is a run-length compressed version of the image data described in section 6.2. Bytes with a value of 0h or FFh are followed by another byte indicating the number of times that value is repeated.

For example, suppose the original (uncompressed) image file has a sequence of bytes like this: (all values are in hexadecimal)
00 01 02 03 04 00 00 00 00 00 00 FF FD FF FF FF FF FF 00 FF

The encoded result would look like this:
00 00 01 02 03 04 00 05 FF 00 FD FF 04 00 00 FF 00

Here's the interpretation:
00 - the first byte is 00
00 - count of 0 - the previous 00 byte is not repeated
01 - a 01 byte
02 - a 02 byte
03 - a 03 byte
04 - a 04 byte
00 - another 00 byte in the file
05 - count of 5 - insert 5 more 00 bytes (total of 6 in sequence)
FF - a FF byte
00 - count of 0 - the previous FF byte is not repeated
FD - a FD byte
FF - another FF byte
04 - count of 4 - insert 4 more FF bytes (total of 5 in sequence)
00 - another 00 bytes
00 - count of 0 - the previous 00 byte is not repeated
FF - another FF byte
00 - count of 0 - the previous FF byte is not repeated.

The compression scheme is slightly inefficient for single occurrences of 0h or FFh, causing these to occupy 2 bytes each. However, most image bitmaps include large areas of either blank space (which is coded as large numbers of 0h bytes) or black space (coded as large numbers of FFh bytes).

If a string of more than 255 0h or FFh bytes occurs, the byte-plus-count sequence may be repeated as often as necessary to incorporate all occurrences of the byte. For example, a string of 1132 FFh bytes in sequence can be encoded as:

FF FF FF FF FF FF FF FF FF 6B

The first four pairs of FFh each encode 256 bytes of FFh (one for the first byte and 255 copies), totaling 1024 bytes of FFh. The next FFh byte adds another, and the 6Bh adds 107 more copies. Thus, (4 x 256) + 1 + 107 = 1132 FFh bytes.

6.2.2 UNCOMPRESSED IMAGE COMMAND (^D106)
This command allows graphic images or fonts to be transmitted in ASCII-HEX, thereby allowing all image data to pass over a 7 bit connection. This command is useable on data connections that support 7 or 8 bit data.

The following is the format of ^D106 command when used with a graphic image file.

^A *<slot number>* ^D106**?**
<rotation> <count> <image data>

Where:
<slot number> is a slot number, 1 through 255 (in ASCII). Note: The 466 uses the same TCI for fonts and graphics. They are both accessed by using a TCI of 8. Therefore a font and a graphic cannot have the same CGN number.

<rotation> is an 8-bit integer, 0 for an upright font and 1 for a 90-degree rotated image.

<count> is a 32-bit integer, least significant byte first. This is the number of bytes that the image uses.

<image data> is the graphic image data, described in section 6.3, which has been converted to ASCII-HEX. (The ASCII-HEX conversion is described below.)

ASCII-HEX Conversion
The ASCII-HEX conversion is preformed by OR'ing the most significant and least significant nibbles of every byte with 30h.

For example: To convert the byte 6C to ASCII-HEX, simply OR the first and second nibbles with 30h. This results in two bytes 36h and 3Ch. This conversion results in a file size that is twice a big as the source. The main advantage is that the file can be easily transmitted across a 7 bit data connection.

The following graphics file structure is offered to programmers who with to use their own programs to convert graphic images.

Note: The 466 does not differentiate between graphics and fonts. They are both accessed by using a TCI of 8. Therefore a font and a graphic cannot have the same CGN number. A graphic is simply a font with only one character and all characters point to the same character.

The 466 font structure consists of commands, a header, a look-up table, a character descriptor, and character data. All words are in Intel format: low byte, high byte. The graphic image structure is the same as the font structure.

Sample Graphic
Figure 14

Note: All multi-byte hexadecimal fields are written least-significant-byte first.

Font/Graphic File Format and Sample Data			
File Data	**Size**	**Name**	**Notes**
^An ^D106	freeform, <CR> terminated	Download Cmd	n = user font number (1-255)

ASCII-HEXED Data	**Size**	**Name**	**Notes**
00	1 byte	Orientation	00h = upright, 01h = 90 deg.
B2000000	4 bytes	File Length	length of remaining data in bytes
1E00	2 bytes	Max Cell Height	>= height of image (or tallest character in font)
00	1 byte	Default Spacing	
20	1 byte	First Printable Char	
20	1 byte	Last Printable Char	
20	1 byte	Default Char	Char to use if not a printable char.
04000000	4 bytes	Char Offset	Distance in bytes from beginning of this field to beginning of corresponding character structure (Char Height). (Repeat field as needed for each character in font. Only one character is used in a graphic file.)
1E00	2 bytes	Char Height	Height of char image in dots (corresponds to number of bytes in character generator table for this char.) [1]
2800	2 bytes	Char Width	Width of char image in dots
0000	2 bytes	Top Offset	Distance in dots between top of char image and Max Cell Height [1]
0000	2 bytes	Bottom Offset	Distance in dots between bottom of char and bottom of cell. [1]
0000	2 bytes	Right Offset, Non	Signed right offset for non-proportional fonts
0000	2 bytes	Left Offset, Non	Signed left offset for non-proportional fonts
0000	2 bytes	Right Offset, Prop	Signed right offset for proportional fonts
0000	2 bytes	Left Offset, Prop	Signed left offset for proportional fonts
0500	2 bytes	Byte Width	Width of char image data in bytes ((Char Width + 7) / 8)
6060606060	5 bytes	Bottom row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	

F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
F0F0F0F0F0	5 bytes	Middle row of image	
FFFFFFFFF0	5 bytes	Middle row of image	
FFFFFFFFF0	5 bytes	Middle row of image	
FFFF9FFFF0	5 bytes	Middle row of image	
FFFF0FFFF0	5 bytes	Middle row of image	
FFFF0FFFF0	5 bytes	Middle row of image	
7FFE07FFE0	5 bytes	Top Row of Image	

Notes:

1.) For any character, the sum of the Char Height, Top Offset, and Bottom Offset must equal the Max Cell Height for the font. Top Offset and Bottom Offset are used to vertically position any character in the field.

2.) The fields Char Height through Top Row of Image are repeated as needed for each character in the font.

6.3   DOWNLOADABLE GRAPHICS COMMAND SUMMARY

The following commands refer to the use of downloadable fonts and graphic images:

^A   **^D**   **Command**

100   **Clear User RAM:** This command will clear all downloaded fonts, graphics, and stored label formats.

101   **List Memory Bytes Available:** The printer will send a < character followed by the amount of bytes and finally a > character. (ie. >699842<)

XX   **106**   **Load Graphic Image or Font into User Memory:** ^A select which slot to place the image/font in (1-255).

CHAPTER 7: DOWNLOADABLE FONTS

The 466 is capable of storing up to 255 downloadable fonts. The printer treats downloadable fonts just like the standard bitmapped fonts mentioned in Chapter 4. The "JET2466.EXE" software utility can be used to convert LaserJet II™ compatible fonts and the "TTF2MIC.EXE" utility can convert TrueType® fonts. (Note: The "JET2466.EXE" program uses the Portrait or 0 degree source rotation for both normal and rotated fonts.)

Downloadable fonts are accessed in the same manner as embedded fonts but use a TCI value of 8. The CGN selects the downloaded font number to use.

The following is a list of commands referring to downloadable font functions.

^A	^D	Command
	100	**Clear User RAM:** This command will clear all downloaded fonts, graphics, and stored label formats.
	101	**List Memory Bytes Available:** The printer will send a < character followed by the amount of bytes and finally a > character. (ie. >699842<)
XX	106	**Load Font/Graphic Image into User Memory:** ^A select which slot to place the font/image in (1-255).

The following section details the process required to convert and load user defined fonts. The conversion utility "JET2466.EXE" is available on request. This DOS utility converts fonts from the popular .SFP format in to a format suitable for downloading to the 466 printer.

Note: The 466 treats fonts and graphics the same. Please refer to Chapter 6 for the font/graphic structure.

7.1 PROCEDURE FOR USING JET2466.EXE UTILITY
A) Type at DOS prompt - JET2466 filename.ext
B) Follow the on screen instructions and note the slot # the image was placed in.
C) Down-load resulting file (filename.N66 or .R66) file to printer
D) Section 4.5.3 explains how to access loaded images.

CHAPTER 8: BAR CODES

Although bar codes are accessed in the same manner as text fields, bar codes often limit or expand the type of data that can be used. The purpose of this chapter is to explain many of the questions that surface when dealing with bar codes for the first time.

8.1   TYPES OF BAR CODES

Universal Product Code - Version A (UPC-A), TCI=12

The UPC-A bar code is primarily used in the supermarket industry. It contains 11 numeric data characters and a single numeric check digit. The 466 must be provided 11 digits in order to print a scanable bar code. The first 6 digits are supplied by the UCC council and are the Manufacture's ID number. The next 5 digits uniquely identify each of the Manufacture's products and are assigned by the Manufacturer. The 12th digit is the checksum and should be omitted because the printer will automatically insert the correct value if a checksum is not sent (Caution: The printer will accept and print an invalid check digit if an incorrect check digit is provided). UPC-A bar codes do not use inter character spacing and therefore the character spacing element CS must be defaulted.

Universal Product Code - Version E (UPC-E, send 11 digits), TCI=13

The UPC-E bar code is primarily used in the supermarket industry. The bar code algorithm uses a zero suppression routine to reduce certain 11 digit UPC-A bar codes to only 6 numeric digits and a conversion type numeric digit. The following chart illustrates how 11 digits are reduced to only 6. (Note: When using TCI 13, the printer requires the unconverted 11 digits.) UPC-E bar codes do not use inter character spacing and therefore the character spacing element CS must be defaulted. Note: The Manufacturer's ID number must begin with 0 in order to use UPC-E.

UPC Zero Reduction Format	
SYMBOL	DECODED NUMBER
X1 X2 X3 X4 X5 0	NS X1 X2 0 0 0 0 0 X3 X4 X5
X1 X2 X3 X4 X5 1	NS X1 X2 1 0 0 0 0 X3 X4 X5
X1 X2 X3 X4 X5 2	NS X1 X2 2 0 0 0 0 X3 X4 X5
X1 X2 X3 X4 X5 3	NS X1 X2 X3 0 0 0 0 0 X4 X5
X1 X2 X3 X4 X5 4	NS X1 X2 X3 X4 0 0 0 0 0 X5
X1 X2 X3 X4 X5 5	NS X1 X2 X3 X4 X5 0 0 0 0 5
X1 X2 X3 X4 X5 6	NS X1 X2 X3 X4 X5 0 0 0 0 6
X1 X2 X3 X4 X5 7	NS X1 X2 X3 X4 X5 0 0 0 0 7
X1 X2 X3 X4 X5 8	NS X1 X2 X3 X4 X5 0 0 0 0 8
X1 X2 X3 X4 X5 9	NS X1 X2 X3 X4 X5 0 0 0 0 9

Table 9

Universal Product Code - Version E (UPC-E, send 7 digits), TCI=14
TCI 14 is the same as TCI 13 except that only the actual 7 numeric digits are used to produce the bar code. (Caution: It is very important that the valid 7 digits are used. Failure to use valid numbers may result in incorrect bar codes.)

Interleaved 2 of 5 TCI=15 (I2of5)
I2of5 is a high density, variable length, numeric bar code that is used mainly in the distribution industry. Although the data can be any length, there must always be an even number of characters. If an odd amount of characters is required, a 0 is normally padded at the beginning. I2of5 bar codes actually encode characters in the spaces as well as the bars. Therefore the character spacing element (CS) must be defaulted.

Code 3 of 9 (Code 39), TCI=16
Code 39 is one of the more popular variable length, alphanumeric, bar code in use today. It can encode numeric characters 0 through 9, all upper case letters, and the characters -.*$/+% and space. Although most specifications require a specific inter character spacing, Code 39 will allow custom inter character spacing as long as the maximum does not exceed the timeout zone of the intended scanning equipment.

European Article Numbering System - Version 13 (EAN-13), TCI=20
EAN-13 contains 13 digits and is constructed in the same manner as UPC-A.

European Article Numbering System - Version 8 (EAN-8), TCI=21
EAN-8 contains 8 numeric digits. Please note that EAN-8 does not use compression and is not a condensed version of EAN-13 (as with UPC-A and UPC-E).

Modified Plessey (MSI 1), TCI=24
MSI is primarily used on retail self labels. It is a low density and numeric only bar code due to the amount of space that each character consumes. MSI 2 and MSI 3 are variations which contain 1 or 2 check digits respectively.

Postnet, TCI=36
Postnet is a numeric only bar code that is used in postal applications to sort mail.

MaxiCode, TCI=38
Modes 2 through 6 of the AIM International MaxiCode specification are supported. Modes 0 and 1 are obsolete, and are not supported.

The format field to describe a MaxiCode label field shall have a TCI of 38 and a CGN with the desired Mode (2-6).

MaxiCode may encode non-printable characters, and Modes 2 and 3 require certain control characters for compatibility with transport industry standards. In order to specify a control character in a MaxiCode data string without causing printer difficulties, use the pound symbol ('#') followed by two hexadecimal digits that give the value of the control character. For example, "#01" specifies Control-A (ASCII SOH) and "#1D" specifies Control-] (ASCII GS). In order to specify an actual pound symbol in the string, use "##". The following table shows all the "#" equivalents that may be used.

Data String	Control Equiv.	ASCII Name	Hex Value
#00	control-@	NUL	00
#01	control-A	SOH	01
#02	control-B	STX	02
#03	control-C	ETX	03
#04	control-D	EOT	04
#05	control-E	ENQ	05
#06	control-F	ACK	06
#07	control-G	BEL	07
#08	control-H	BS	08
#09	control-I	HT	09
#0A	control-J	LF	0A
#0B	control-K	VT	0B
#0C	control-L	FF	0C
#0D	control-M	CR	0D
#0E	control-N	SO	0E
#0F	control-O	SI	0F
#10	control-P	DLE	10
#11	control-Q	DC1	11
#12	control-R	DC2	12
#13	control-S	DC3	13
#14	control-T	DC4	14
#15	control-U	NAK	15
#16	control-V	SYN	16
#17	control-W	ETB	17
#18	control-X	CAN	18
#19	control-Y	EM	19
#1A	control-Z	SUB	1A
#1B	control-[	ESC	1B
#1C	control-\	FS	1C
#1D	control-]	GS	1D
#1E	control-^	RS	1E
#1F	control-_	US	1F
##	(NA)	# (pound)	23

Control Code Equivalents for use in Data Strings
Table 10

The data string associated with a MaxiCode field shall be formatted according to the Mode selected:

Mode 2:
Mode 2 may have either of the following formats:

[)>#1e01#1dYYPPPPPPPPPP#1dCCC#1dSSS#1dA..A#1dB..B#1dC..C#1e#04

Where:

#1e is the ASCII RS character
#1d is the ASCII GS character
#04 is the ASCII EOT character
YY is the two-digit numeric year

PPPPPPPPP is the nine-digit numeric US Postal Code. (If using a 5-digit postal code, the last 4 digits must be 0.)
CCC is the three-digit numeric Country Code. (840 in the US)
SSS is the three-digit numeric Class of Service
A..A, B..B, C..C, etc. are variable-length alphanumeric fields separated by #1d. These fields are optional according to the MaxiCode specification, but may be required in certain applications.

PPPPPPPPP#1dCCC#1dSSS#1dA..A#1dB..B#1dC..C#04

Where the fields are the same as those described above.

Mode 3:
Mode 3 may have either of the following formats:

[)>#1e01#1dYYPPPPPP#1dCCC#1dSSS#1dA..A#1dB..B#1dC..C#1e#04

Where:

#1e is the ASCII RS character
#1d is the ASCII GS character
#04 is the ASCII EOT character
YY is the two-digit numeric year
PPPPPP is the six-character alphanumeric Postal Code.
CCC is the three-digit numeric Country Code.
SSS is the three-digit numeric Class of Service
A..A, B..B, C..C, etc. are variable-length alphanumeric fields separated by #1d. These fields are optional according to the MaxiCode specification, but may be required in certain applications.

PPPPPP#1dCCC#1dSSS#1dA..A#1dB..B#1dC..C#04

Where the fields are the same as those described above.

Mode 4:
Mode 4 may encode any string of up to 93 characters. Control characters are specified as described above, but occupy only 1 character in the encoded string.

Mode 5:
Mode 5 may encode any string of up to 77 characters. Control characters are specified as described above, but occupy only 1 character in the encoded string.

Mode 6:
Mode 6 may encode any string of up to 93 characters. Control characters are specified as described above, but occupy only 1 character in the encoded string.

Code 128 (Automatic Compression, TCI=40), (Manual Compression, TCI-41)
Code 128 is a very high density, variable length, full alphanumeric bar code. It contains 3 separate character sets (A, B, and C) and separate shift characters to access them in the same bar code. Subset C contains 99 matched numeric pairs, each encoded as a single character. The pairing of numeric characters allows numeric portions of the bar code to

consume half as much space as they would using Subsets A or B. If TCI 40 is selected, the printer will automatically decide which subset is most efficient and insert the appropriate shift character. It is also possible to manually change the subset by using TCI=41. Please note that the correct rules must be followed to prevent and incorrect bar code.

Code 128 Special Function Access				
#	Value	CODE A	CODE B	CODE C
#0	96	FNC3	FNC3	-----
#1	97	FNC2	FNC2	-----
#2	98	SHIFT	SHIFT	-----
#3	99	CODE C	CODE C	-----
#4	100	CODE B	FNC4	CODE B
#5	101	FNC4	CODE A	CODE A
#6	102	FNC1	FNC1	FNC1
#7	103	START	-----	-----
#8	104	-----	START	-----
#9	105	-----	-----	START
#M or #m	77	CR	-----	-----
##	3	#	#	-----

Table 11

Codabar (Rationalized Codabar), TCI=42
The Codabar bar code is typically used to identify air shipping containers, library items and blood information. It can encode the characters 0 through 9, -$:.+ABCD and four different start/stop characters.

Code 93, TCI=43
Code 93 is a high density, full alphanumeric, variable length, bar code. Through the use of reserved shift characters, it can encode all of the first 128 ASCII characters.

AS-10, TCI=44
AS-10 is not widely used. It is variable length and encodes the numeric values 1234567890 only.

PDF-417, TCI=46
PDF-417 is a two dimensional bar code.

Enter the following command before the label format:
:Text^[
number_of_rows<CR>

```
number_of_columns<CR>
rotation<CR>                          ;in degrees (0, 90, 180, 270 only)
ECC_percent<CR>                       ;error correction parameter
ECC_level<CR>                         ;level of error correction
Aspect_ratio<CR>                      ;must be in format of, ex., 2:3
```

(Where "Text" is the data to be encoded in the PDF-417 bar code. It may contain carriage returns and other control codes. It must be terminated by the characters "^[" (without quotes) which will not be printed.)

Enter a normal label format with a field specifying a TCI of 46 and a CC of 1.
The string associated with the field described above need contain only 1 character. It may be any printable character, and is used only as a placeholder. This character is not printed.

<u>UCC/EAN-128, TCI=50 (TCI=51 is the text version)</u>
UCC/EAN-128 bar codes are actually Code 128 bar codes that have a specific data format that contains multiple data subfields. Subfields are identified by application identifiers as specified in <u>UCC/EAN-128 Application Identifier Standard</u> (January 1993, revised and reprinted July 1995).

The UCC/EAN-128 bar code field has a TCI of 50. The CGN field is ignored.

The UCC/EAN-128 text field has a TCI of 51. The CGN selects the desired resident font for printing the text string. In other words, use the same CGN that would be used if printing the string with a regular resident font using a TCI of 1.

Data strings can contain one or more substrings appended onto one line. Each substring can consists of a 2-, 3-, or 4-digit Application Identifier immediately followed by a data string meeting the formatting requirements for that Application Identifier.

The following table is a list of supported Application Identifiers and their data format requirements. Use this legend when reading the data format requirements:

a   alphabetic character
n   numeric character
an   alphanumeric character
a3   3 alphabetic characters, fixed length
n3   3 numeric characters, fixed length
an3   3 alphanumeric characters, fixed length
a..3   variable length up to 3 alphabetic characters
n..3   variable length up to 3 numeric characters
an..3   variable length up to 3 alphanumeric characters

AI	Content	Format
00	SSCC-18	n2+n18
01	SCC-14	n2+n14
10	Batch or Lot Number	n2+an..20
11(*)	Production Date (YYMMDD)	n2+n6
13(*)	Packaging Date (YYMMDD)	n2+n6
15(*)	Sell By Date (Quality) (YYMMDD)	n2+n6
17(*)	Expiration Date (Safety) (YYMMDD)	n2+n6

AI	Content	Format
20	Product Variant	n2+n2
21	Serial Number	n2+an..20
22	HIBCC - Quantity, Date, Batch and Link	n2+an..29
23(**)	Lot Number (Transitional Use)	n3+n..19
240	Additional Product Identification assigned by the Manufacturer	n3+an..30
250	Secondary Serial Number	n3+an..30
30	Quantity	n2+n..8
310(***)	Net Weight, Kilograms	n4+n6
311(***)	Length or 1st Dimension, Meters	n4+n6
312(***)	Width, Diameter or 2nd Dimension, Meters	n4+n6
313(***)	Depth, Thickness, Height or 3rd Dimension, Meters	n4+n6
314(***)	Area, Square Meters	n4+n6
315(***)	Volume, Liters	n4+n6
316(***)	Volume, Cubic Meters	n4+n6
320(***)	Net Weight, Pounds	n4+n6
321(***)	Length or 1st Dimension, Inches	n4+n6
322(***)	Length or 1st Dimension, Feet	n4+n6
323(***)	Length or 1st Dimension, Yards	n4+n6
324(***)	Width, Diameter, or 2nd Dimension, Inches	n4+n6
325(***)	Width, Diameter, or 2nd Dimension, Feet	n4+n6
326(***)	Width, Diameter, or 2nd Dimension, Yards	n4+n6
327(***)	Depth, Thickness, Height or 3rd Dimension, Inches	n4+n6
328(***)	Depth, Thickness, Height or 3rd Dimension, Feet	n4+n6
329(***)	Depth, Thickness, Height or 3rd Dimension, Yards	n4+n6
330(***)	Gross Weight, Kilograms	n4+n6
331(***)	Length or 1st Dimension, Meters, Logistics	n4+n6
332(***)	Width, Diameter or 2nd Dimension, Meters, Logistics	n4+n6
333(***)	Depth, Thickness, Height or 3rd Dimension, Meters, Logistics	n4+n6
334(***)	Area, Square Meters, Logistics	n4+n6
335(***)	Gross Volume, Liters	n4+n6
336(***)	Gross Volume, Cubic Meters	n4+n6
340(***)	Gross Weight, Pounds	n4+n6
341(***)	Length or 1st Dimension, Inches, Logistics	n4+n6
342(***)	Length or 1st Dimension, Feet, Logistics	n4+n6
343(***)	Length or 1st Dimension, Yards, Logistics	n4+n6
344(***)	Width, Diameter or 2nd Dimension, Inches, Logistics	n4+n6
345(***)	Width, Diameter or 2nd Dimension, Feet, Logistics	n4+n6
346(***)	Width, Diameter or 2nd Dimension, Yards, Logistics	n4+n6
347(***)	Depth, Thickness, Height or 3rd Dimension, Inches, Logistics	n4+n6
348(***)	Depth, Thickness, Height or 3rd Dimension, Feet, Logistics	n4+n6
349(***)	Depth, Thickness, Height or 3rd Dimension, Yards, Logistics	n4+n6
350(***)	Area, Square Inches	n4+n6
351(***)	Area, Square Feet	n4+n6
352(***)	Area, Square Yards	n4+n6
353(***)	Area, Square Inches, Logistics	n4+n6
354(***)	Area, Square Feet, Logistics	n4+n6
355(***)	Area, Square Yards, Logistics	n4+n6
356(***)	Net Weight, Troy Ounce	n4+n6
360(***)	Volume, Quarts	n4+n6
361(***)	Volume, Gallons	n4+n6

AI	Content	Format
362(***)	Gross Volume, Quarts	n4+n6
363(***)	Gross Volume, Gallons	n4+n6
364(***)	Volume, Cubic Inches	n4+n6
365(***)	Volume, Cubic Feet	n4+n6
366(***)	Volume, Cubic Yards	n4+n6
367(***)	Gross Volume, Cubic Inches	n4+n6
368(***)	Gross Volume, Cubic Feet	n4+n6
369(***)	Gross Volume, Cubic Yards	n4+n6
400	Customer's Purchase Order Number	n3+an..30
410	Ship To (Deliver To) Location Code Using EAN-13	n3+n13
411	Bill To (Invoice To) Location Code Using EAN-13	n3+n13
412	Purchase From (Location Code of Party from Whom Goods are Purchased)	n3+n13
414	EAN Location Code for Physical Identification	n3+n13
420	Ship To (Deliver To) Postal Code Within a Single Postal Authority	n3+an..9
421	Ship To (Deliver To) Postal Code With 3-Digit ISO Country Code Prefix	n3+n3+an..9
8001	Roll products - Width, Length, Core Diameter, Direction and Splices	n4+n14
8002	Electronic Serial Number for Cellular Mobile Telephones	n4+an..20
8003	UPC/EAN Number and Serial Number of Returnable Asset	n4+n14+an..16
8100	Coupon Extended Code - Number System Character and Offer	n4+n1+n5
8101	Coupon Extended Code - Number System Character, Offer, and End of Offer	n4+n1+n5+n4
8102	Coupon Extended Code - Number System Character preceded by zero	n4+n1+n1
90	Mutually Agreed, Between Trading Partners or FACT DIs	n2+an..30
91	Intra-Company (Internal)	n2+an..30
92	Intra-Company (Internal)	n2+an..30
93	Intra-Company (Internal)	n2+an..30
94	Intra-Company (Internal)	n2+an..30
95	Internal-Carriers	n2+an..30
96	Internal-Carriers	n2+an..30
97	Intra-Company (Internal)	n2+an..30
98	Intra-Company (Internal)	n2+an..30
99	Internal	n2+an..30

UCC/EAN Application Identifiers
Table 12

(*) : To indicate only year and month, DD must be filled with "00"
(**) : Plus one digit for length indication
(***) : Plus one digit for decimal point indication

Each subfield's format is expressed as the format of the Application Identifier number + the format of the associated data. Each subfield must adhere to the format specified or else the printer will be unable to locate following subfields, causing errors in printing.

Any variable length subfield (unless it is the last subfield in a field) must be terminated by the characters "#6" (without quotes). These characters are translated to the Code 128 "FNC1"

character, which is specified by UCC/EAN-128 as the variable-length field terminator. The "#6" is not printed.

When printing a UCC/EAN-128 text field, the printer automatically surrounds each application identifier number with parentheses, and follows the right parenthesis with a space character. Do not use parentheses or spaces when specifying an application identifier string.

Several application identifiers (00, 01, 22, 8003) specify fields that will have a check digit as part of their data. A character must be included in the check digit place (although it need not be the correct check digit.) This character is used only as a placeholder and will not be printed. The printer will calculate the correct check digit and replace the character already there.

^A3^D97**?**
^D57**?**
6,832,600,,,30**?**
1,50,100,80,40,,0,,2,100**?**
1,50,300,80,50,,0,,2,100**?**
1,50,500,80,51,5,0**?**
2,50,60,30,1,3**?**
3,50,260,30,1,3**?**
4,50,460,30,1,3**?**
^D56**?**
^D2**?**
011234567890123-420abcde#63101123456**?**
code128**?**
EAN128**?**
EAN128 Human Readable**?**
^D3**?**

8.2   DESIGNING WITH BAR CODES

When 0 and 180 degree bar codes are X multiplied (CMX), the space between characters is also multiplied to maintain the correct ratios. The printer will do this internally. Therefore, when multiplying bar codes, use the default value for the spacing element (SP) in the field parameters. On some bar codes (CODE 39 ...) you may choose a larger spacing than the printer default, but you may not use a smaller spacing.

If the Y multiplier (CMY) is not multiplied, a bar code with a vertical length of one dot is produced. Of course, this will not be picked up by scanners. Multiply the Y co-ordinate to the proper height. For example: Multiply the Y co-ordinate (CMY) by 203 to create a one inch tall bar code.

If the bar code is in a ladder (or vertical) orientation (90 and 270 degrees), multiply CMY for width, and CMX for bar code length. It may be necessary to slightly adjust the contrast window and/or adjust the print speed due to the "bleeding" effect caused by heat build up in the print head.

Program sample: Bar codes in four rotations (See Figure 11)

^D57?
9,814,609?
1,410,30,11,1,4,,4?
2,410,100,11,1,2,,4?
2,410,137,3,16,2,,4,3,40?
3,680,300,11,1,2,3,4?
3,640,300,3,16,2,3,4,40,3?
4,410,500,11,1,2,1,4?
4,410,465,3,16,2,1,4,3,40?
5,140,300,11,1,2,2,4?
5,180,300,3,16,2,2,4,40,3?
^D56?
^D2?
ROTATIONS?
000 DEGREES?
090 DEGREES?
180 DEGREES?
270 DEGREES?
^D3?
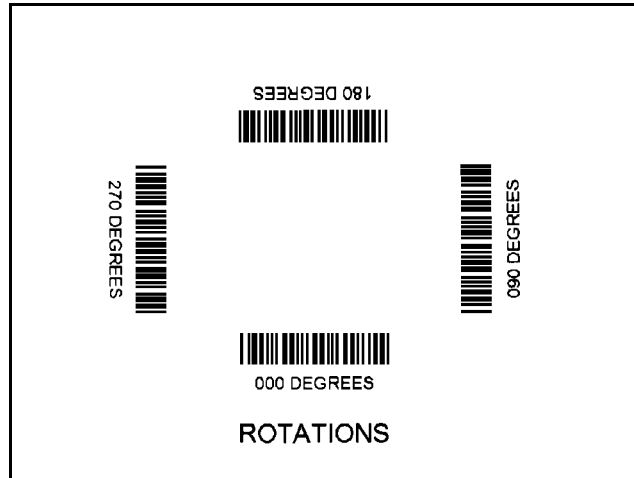
Bar Code Rotations
Figure 15

8.2.1   BAR CODE HUMAN READABLES

Text conversion identifiers (TCI position in field description) 32 and 33 refer to the human readable portion of UPC-A bar codes. They are designed to be used in conjunction with UPC-A bar codes, They only create the text equivalent of the UPC-A bar code and optionally add the extended portions of the bar code lines. This lower portion must them be lined up with the upper to create a correct UPC-A bar code. (See Figure 16)

<---------------- UPC-A BAR CODE

<---------------- Human Readable

UPC-A Bar Code
Figure 16

Text conversion identifiers 28 and 29 are MSI human readables that do not border themselves with bar lines like 32 and 33. Their purpose is only to add the calculated check digit(s) to text lines. To design with these TCI's, select a text character generator number and multiply as with any other text field. Place this field underneath the MSI bar code. TCI 3 works in this same way but for UPC-A bar codes. All other bar code human readables only require a text TCI of 1, a user selectable text character generator, and text positioning under the desired bar code. This field must refer to the bar code number.

^D57?
16,814,609?
1,100,20,17,1,1?
3,60,37,11,32,,,,2,2?
3,82,55,11,12,,,,2,60?
2,375,20,19,1,1?
3,350,37,11,33,,,,2,2?
3,372,55,11,12,,,,2,60?
4,80,150,19,1,1?
4,65,167,12,20,,,,2,60,,8?
5,408,150,14,1,1?
5,395,167,7,21,,,,2,60,,7
6,110,270,5,1,1?
6,120,287,12,13,,,,2,60,,8?
9,180,270,8,3,1?
7,400,270,5,1,1?
7,470,287,12,13,,,,2,60,,8?
8,460,270,8,3,1?
^D56^D2?
UPC-A HR W/CHKSUM?
UPC-A HR W/O CHKSUM?
01234567890?
EAN13 012345678901?
EAN8 0123456?
UPC-E 00123400005?
UPC-E 10123400005?
^D3?


Bar Code Human Readables
Figure 17

CHAPTER 9: SPECIAL EFFECTS

9.1   REVERSED PRINT (WHITE TEXT OVER BLACK)

The 466 has the ability to print white text on a user definable black background. Reversed text can be produced by manually placing a black box on top of an existing image by using the line command and setting the line and text field ANs (attribute numbers) to a value of 1. It should be noted that the above method produces a fixed background that will not automatically adjust to the amount of text printed on top.

Reverse video sample:

^D57**?**
2,812,609**?**
1,200,425,13,1,8,,,,,,,,,,1**?**
1,170,410,,6,,,,450,90,,,,,,,1**?**
^D56**?**
^D2**?**
REVERSE VIDEO**?**
^D3**?**
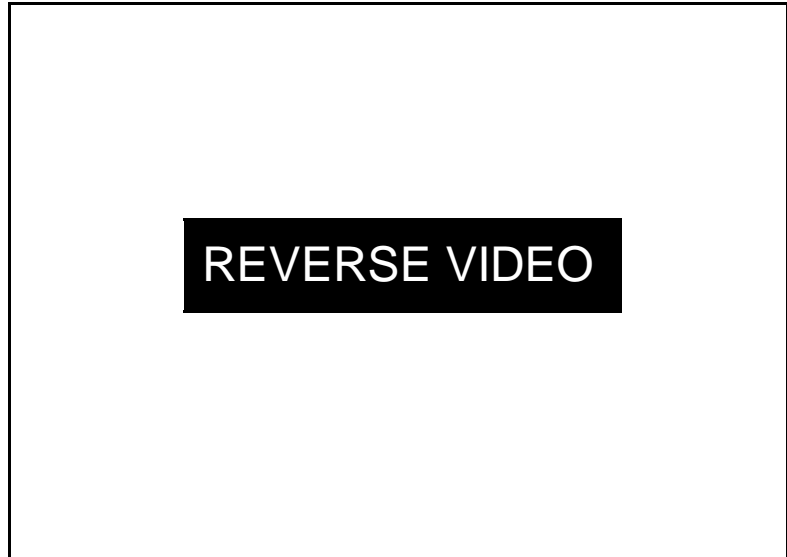
REVERSE VIDEO

Reverse Video Sample
Figure 16

CHAPTER 10: OPTIONS

The 466 printer has many options available to enhance the performance of the printer. Contact your sales representative for more information on these features.

10.1   GRAPHICS CONVERSION UTILITIES
PCX2MIC.EXE or BMP2MIC.EXE
These DOS based software programs convert PCX or BMP files to the Microcom Corporation 466 format. See Section 4.5 and Chapter 6 for more information about printing graphic images.

10.2   DOWNLOADABLE FONT UTILITIES
JET2466.EXE or TTF2MIC.EXE
These DOS based software programs convert LaserJet™ or TrueType® compatible fonts to the Microcom Corporation 466 format. Converted fonts may be stored in user RAM for future use. See Chapter 7 for more information on downloadable fonts. Please note that the battery backup option is necessary to permanently store downloaded fonts.

10.3   WYSIWYG SOFTWARE PACKAGES
WYSIWYG Software packages offer a WYSIWYG (**W**hat **Y**ou **S**ee **I**s **W**hat **Y**ou **G**et) label design environment.

10.4   CLEANING KIT
An approved cleaning kit is offered for the 466 printer. It is suggested the printer be cleaned once every two weeks, every 5,000 labels, or whenever label stock is replaced.

10.5   WINDOWS™ DRIVER
Windows™ 95/98/NT/2000 drivers are available upon request. These drivers greatly increase the number of programs that may used to create labels for the model 466.

APPENDIX A: WARRANTY AND REPAIR PROCEDURES

LIMITED WARRANTY

Microcom Corporation printers, excluding thermal print heads which are warranted separately below, are warranted against defects in material and workmanship for twelve (12) months from the date of original shipment by Microcom Corporation. This warranty does not cover normal wear and tear and shall be null and void if the printer is modified, improperly installed or used, damaged by accident or neglect, or in the event any parts are improperly installed or replaced by the user.

The thermal print head is covered by a limited warranty of three (3) months or 500,00 linear inches to be free from defects in material and workmanship. The length of media run through the printer may be verified using the printer's internal statistical counter. Although the user is not required to purchase Microcom Corporation brand supplies, to the extent it is determined that the use of other supplies (such as non-approved label stock, ribbons, and cleaning solutions) shall have caused any defects in the thermal print head for which the warranty claim has been made, the user shall be responsible for Microcom Corporation's customary charges for labor and materials to repair such defects.

MICROCOM CORPORATION'S SOLE OBLIGATION UNDER THIS WARRANTY SHALL BE TO FURNISH PARTS AND LABOR FOR THE REPAIR OR REPLACEMENT OF PRODUCTS FOUND TO BE DEFECTIVE IN MATERIAL OR WORKMANSHIP DURING THE WARRANTY PERIOD.

Except for the express warranties stated, Microcom Corporation disclaims all warranties on products, including all implied warranties of merchantability and fitness for a particular purpose. The stated warranties and remedies are in lieu of all other warranties, obligations or liabilities on the part of Microcom Corporation for any damages, including, but not limited to, special, indirect, or consequential damages arising out of or in conjunction with the sale, use, or performance of the products.

MICROCOM CORPORATION SHALL NOT, UNDER ANY CIRCUMSTANCES WHATSOEVER, BE LIABLE TO BUYER OR ANY OTHER PARTY FOR LOST PROFITS, DIMINUTION OF GOODWILL OR ANY OTHER SPECIAL OR CONSEQUENTIAL DAMAGES WHATSOEVER WITH RESPECT TO ANY CLAIM HEREUNDER. IN ADDITION, MICROCOM CORPORATION'S LIABILITY FOR WARRANTY CLAIMS SHALL NOT, IN ANY EVENT, EXCEED THE INVOICE PRICE OF THE PRODUCT CLAIMED TO BE DEFECTIVE, NOR SHALL MICROCOM CORPORATION BE LIABLE FOR DELAYS IN REPLACEMENT OR REPAIR OF PRODUCTS.

RETURN MATERIAL AUTHORIZATION (RMA) PROCEDURE

A Return Material Authorization (RMA) number must be obtained prior to the return of printers and/or materials the Microcom Corporation Service Department. The purpose of the RMA number is to provide effective tracking and control of returned printers and/or materials. Microcom Corporation will not be responsible or accountable for printers and/or materials returned without proper authorization.

Shipping Charges:

The return of printers and/or materials returned to Microcom Corporation for repair should be returned freight and insurance prepaid. Microcom Corporation will pay the return shipping charges (standard ground service) on all warranty repairs, expedited services will be paid at customer expense. The return of non-warranty repair printers and/or materials will be shipped by a shipping carrier and service determined by the customer.

Receiving a Return Material Authorization (RMA) Number:

1. To receive an RMA number, either complete the online RMA request form located on the world wide web (http://www.microcomcorp.com) or contact the Microcom Corporation Service Department and provide the representative with the following information.

- Company Name
- Contact name and phone number.
- Model number
- Serial number
- A detailed description of the problem
- Service Selection (1 Day, 3 Day ,5 Day or Standard turnaround)
- Purchase Order number

2. The shipping label should contain the following information.

Microcom Corporation
Attn: Service Dept. RMA# <place number here >
8220 Green Meadows Dr. N.
Lewis Center, OH 43035 USA

3. Return the defective item(s) for repair to the above listed address, freight and insurance prepaid.

4. Upon receipt of an RMA number, the customer contact will be notified by a Microcom Corporation representative regarding repair charges, at which time the ship method will be determined. Items returned for repair with inadequate packaging material will be returned to the customer in Microcom Corporation approved packaging at the customers expense.

APPENDIX B: QUICK REFERENCE COMMAND SUMMARY

The following is a list of **HEADER** element mnemonics and the default values:
```
HFM,LSX,LSY,WEB,GAP,DPS,LCB,AGD,SPG,OFX,OFY,,,FMT
  0,832,443, 10, 10, 48,  0,  1,479,  0,  0,,, 0
```

The following is a list of **FONT**, **BAR CODE, AND GRAPHIC IMAGE** field mnemonics:
```
TSN,XB,YB,CC,TCI,CGN,FO,FJ,CMX,CMY,CS,TSP,,,,,AN
```

The following is a list of **SQUARE LINE** field mnemonics and the default values:
```
1,XB,YB,,6,,,,XS,YS,,,,,,,AN
1, 1, 1,,6,,,, 1, 1,,,,,,, 0
```

The following is a combined list of all **TCI** (Text Conversion Identifier) numbers:

```
 1  Text (standard)
 2  Text Surrounded by Asterisks
 3  Text with UPC-A/UPC-E Checksum Digit Added
 6  Square Line/Box
 8  Downloadable Fonts and Graphics
12  UPC-A Bar Code
13  UPC-E Bar Code (SEND 11 DIGITS)
14  UPC-E Bar Code (SEND 7 DIGITS)
15  Interleaved 2 of 5 Bar Code
16  Code 3 of 9 Bar Code
17  Text with UPC-E Checksum and Extended Bars Added
20  EAN-13 Bar Code
21  EAN-8 Bar Code
22  Text with EAN-13 Checksum and Extended Bars Added
23  Text with EAN-8 Checksum and Extended Bars Added
24  MSI 1 (Plessey)
25  MSI 2 (Plessey)
26  MSI 3 (Plessey)
28  Text with MSI Checksum Added - Type 1
29  Text with MSI Checksum Added - Type 2
32  Text with UPC-A Checksum and Extended Bars Added
33  Text with UPC-A With Extended Bars Added
36  Postnet (Zip+4)
37  Postnet (Zip+6)
38  Maxicode Bar Code
40  Code 128 Bar Code (Automatic Compression)
41  Code 128 Bar Code (Manual Compression)
42  Codabar Bar Code
43  Code 93 Bar Code
44  AS-10 Bar Code
46  PDF417 Bar Code
50  UCC/EAN-128 Bar Code
51  Text with UCC/EAN-128 Information
```

^A   ^D   Command

    2   **Text string entry mode:** Precedes the text strings that are supplied to the various fields in the label (Equivalent to ^B).

    3   **Print Command:** Prints a single label or starts the printing of a batch of labels. (Equivalent to ^C)

    5   **Send Printer Status:** (Equivalent to ^E)

    11   **Print a Test Label:** (Equivalent to ^K)

    12   **Print a Blank Label:** (Equivalent to ^L)

    13   **Rewind Motor Control:** Enables or Disables the internal rewind motor.
0   Enable
1   Disable

    14   **Cutter Control:** Enables or Disables the paper cutter. (This command is included for compatibility reasons only. Use the ^D99 command for new formats.)
0   Enable
1   Disable

    20   **Bits per Second (COM2):** This sets the data rate of the optional 2nd serial port.

0   300 bps
1   600 bps
2   1200 bps
3   2400 bps
4   4800 bps
5   9600 bps
6   19200 bps
7   38400 bps

    21   **Change SW1:** Change software switch bank #1.

```
        12345678
^ABxxxxxxxx
    *******.) 1=XON/XOFF Enable, 0=Disable (COM1)
    ******.)) 1=Send Status Message on Error (COM1)
    *****.))) 1=Echo Enable, 0=Disable (COM1)
    ****.)))) 1=Send Status Message on Error (COM2)
    ***.))))) Always 0
    **.)))))) 1=Ignore Control Codes, 0=Accept (COM1,COM2
    **        and LPT1)
    *.))))))))),
    .)))))))))),* Status Message Format (COM1 and COM2)
                  00 = Control Codes
                  10 = Text Equivalent
                  11 = ^ Equivalent
```

<u>^A</u>   <u>^D</u>   <u>COMMAND</u>
      22   Change SW2: Change software switch bank #2.

```
        12345678
    ^ABxxxxxxxx
      *******.)))),
      ******.)))),*
      *****.)))),**
      *****      ***_Power-up Label Format_
      *****      000=Power-up Format Disabled
      *****      001=ROM or Saved Format File 1
      *****      010=ROM or Saved Format File 2
      *****      011=ROM or Saved Format File 3
      *****      100=ROM or Saved Format File 4
      *****      101=ROM or Saved Format File 5
      *****      110=ROM or Saved Format File 6
      *****      111=ROM or Saved Format File 7
      ****.)))))) 1=Use Saved Format File, 0=Rom Format
      ***.))))))) 1=Print Button Enable, 0=Disable
      **.)))))))) 1=Line Feed Button Disable, 0=Enable
      *.))))))))) 1=>RESTARTED< Message Enable, 0=Disable
      .)))))))))) 1=Clear Text Enable, 0=Disable
```

      23   Change SW3: Change software switch bank #3.

```
        12345678
    ^ABxxxxxxxx
      *******. Detect Black Line on Power-up (transmissive)
      ******.) Detect Black Line on Power-up (reflective)
      *****.)) 1=Enable TOF button, 0=Disable
      ****.))) 1=Enable TOF at Power-up, 0=Disable
      ***.)))) Always 0
      **.))))) 1=Status after Print (COM1 & 2), 0=No Response
      *.)))))) 1=Disable Extended ASCII, 0=Enable (COM2)
      .))))))) 1=Disable Extended ASCII, 0=Enable (COM1)
```

^A   **^D**   **COMMAND**
       24   **Change SW4:** Change software switch bank #4.

```
        12345678
^ABxxxxxxxx
    *******.))))))),
    ******.))))))),*
    *****.))))))),**
    ****.))))))),***
    ****        0000 = Not decoded (8 bit)
    ****        0001 = Danish (7 bit)
    ****        0010 = 860 (8 bit)
    ****        0011 = Spanish (7 bit)
    ****        0100 = 850 (8 bit)
    ****        0101 = German (7 bit)
    ****        0110 = 865 (8 bit)
    ****        0111 = Swiss (7 bit)
    ****        1000 = 852 (8 bit)
    ****        1001 = French (7 bit)
    ****        1010 = 863 (8 bit)
    ****        1011 = Swedish (7 bit)
    ****        1100 = 437 (8 bit)
    ****        1101 = Italian (7 bit)
    ****        1110 = British (7 bit)
    ****        1111 = US English (7 bit)
    ****
    ***.)))))))) 1=Auto-size on Power-up, 0=Disable
    **.))))))))) 1=Blow-hole Sensing Enable, 0=Disable
    *.)))))))))) Always 0
    .))))))))))) 1=Enable Slashed Zeros, 0=Disable
```

^A   **^D**   **COMMAND**
       25   **Change SW5:** Change software switch bank #5.

```
        12345678
^ABxxxxxxxx
    *******.) 1=XON/XOFF Enable, 0=Disable (COM2)
    ******.)) 1=8 Data Bits, 0=7 Data Bits (COM2)
    *****.))) 1=Echo Enable, 0=Disable (COM2)
    ****.)))) 1=No Parity, 0=Enable Parity (COM2)
    ***.))))) 1=Odd Parity, 0=Even Parity (COM2)
    **.)))))) 1=Ignore Control Codes, 0=Accept (COM2)
    *.))))))))),
    .))))))))))),* Status Message Format (COM2)
                00 = Control Codes
                10 = Text Equivalent
                11 = ^ Equivalent
```

A	**^D**	**COMMAND**
	26	**Change SW6:** Change software switch bank #6.

```
                     12345678
                   ^ABxxxxxxxx
                     *******.  1=Disable ON/OFF LINE Button, 0=Enable
                     ******.)  Not Used
                     *****.))  Not Used
                     ****.)))  1=Stacker Enable, 0=Disable
                     ***.))))  1=Enable Cutter at Power-up, 0=Disable
                     **.)))))  0=Cutter Type A, 1=Cutter Type B
                     *.))))))  1=Use > and # for C128 commands, 0=Use #
                     .)))))))  1=Enable Slew Speed, 0=Disable
```

	29	**Printer Statistics:**
0		Print statistics to serial port
1		Print statistics on a label
2		Clear the printed labels variable in the statistics
3		Clear the printed inches variable in the statistics
	30	**Change Clock:** Use the sequence below to set the time and date of the optional real-time clock: **^D30** (return) **HH:MM:SS** (return) **DD/MM/YY/W** (return)
	31	**Show Clock:** This command will send the date and time to the serial port.
	32	**Reset Machine:** Restores printer to power-up settings.
	33	**Display Model and Revision Number**.
XX	**35**	**Contrast Window Adjust:** This is the temporary contrast adjustment. The ^AXX is between 10 and 200%
XX	**36**	**Adjust Contrast Base:** Non-Volatile command. The ^AXX is between 10 and 200%. Section 5.3.
XX	**37**	**Show Voltages:** This command will send the values of the internal printer voltages.
	39	**Auto-Size Label:** Section 5.3.3.
0		Clears the use of auto-size values set by ^A1^D39.
1		Uses the values obtained for the variables instead of what the user supplies in the header of the format file. Note: The ^D91 value is stored in non-volatile memory.
2		Automatically sizes the label and displays on the screen the values for the size variables.
3		Same as ^A2^D39, but prints the values on a label, instead of on the screen.
10		Move media to "Top of Form" position

     40   **Clear Commands 41-51.**

XX   **41**   **Load number of fields in layout (HFM):** Preceded by ^A.

XX   **42**   **Load label width in dots (LXS):** Preceded by ^A.

XX   **43**   **Load label height in dots (LSY):** Preceded by ^A.

XX   **44**   **Load web size in dots (WEB):** Preceded by ^A.

XX   **45**   **Load gap size in dots (GAP):** Preceded by ^A.

XX   **46**   **Load print speed (DPS):** Preceded by ^A.

XX   **47**   **Load label control byte (LCB):** Preceded by ^A.

XX   **48**   **Load number of steps to activate gap detector (AGD):** Preceded by ^A.

XX   **49**   **Load number of steps past gap (SPG):** Preceded by ^A.

XX   **50**   **Load X direction offset (OFX):** Preceded by ^A.

XX   **51**   **Load Y direction offset (OFY):** Preceded by ^A.

XX   **54**   **Send Saved Format File to Serial Port:** ^A selection which one (1-128). Section 5.3.6.

XX   **55**   **Select Default Label Layout:** Select from the ROM power-up layouts. ^AXX ranges from 1 to 8.

     56   **Select User Defined Layout:** Signals to the printer the end of the label fields and precedes the text fields in a format file.

     57   **Enter Label Format Mode:** This tells the printer that information for a label is following.

XX   **58**   **Process Saved Format:** ^A selects which one (1-128). Section 5.3.6.

XX   **59**   **Save Format File:** ^A selects which one (1-128). Section 5.3.6.

     60   **Clears command 61**

XX   **61**   **Mark Text Starting Position:** ^A designates which text field to start entering new data. Section 5.3.8.

     62   **Pre-padded Text:** This command is sent after text that is to appear at the beginning of each field is sent.

	63	**Text Mode Control:** Section 5.3.8.
0		Disable 1 & 2.
1		Enable auto-print mode
2		Clear all previous text upon receiving new data.
3		Enable 1 & 2.

XX **64** **Auto Print String Count:** ^A tells the printer how many text strings to accept before printing. Section 5.3.

70 **Clear commands 73-76.**

71 **Load Maxicode Bar Code Data:**

72 **Clock Initialization:**

XX **73** **Load copies count:** Tells the printer to print a group of labels. Will not increment serial numbers (use ^D75).

1 **74** **Infinity Print:** Prints a batch of labels like ^D75 but will continue to print until the machine is turned off.

XX **75** **Load Label Count:** Tells the printer to print a batch of labels using the serial number function if enabled.

XX **76** **Load Delay Time Between Labels:** Preceded by ^A which contains the wait in 1/10ths of a second. Maximum value is 650.

77 **Load PDF-417 Bar Code Data:**

80 **Clears Commands 86, 88, 89.**

81 **Disable Serial Number Function:** Will disable either single or multiple serial number commands.

XX **84** **Load Text String Number to Increment/Decrement:** Tells the printer which text string number to increment or decrement. For single serial numbers. Section 5.3.8.

XX **85** **Load Increment/Decrement Step Value:** This is the value that the single serial number is incremented or decremented.

	86	**Single Serial Number Status:**
0		Disable increment and decrement.
1		Enable increment. The serial number will be increased by the value from ^D85.
2		Enable Decrement. The serial number will be decreased by the value from ^D85.

XX **87** **Load Field Number to Clear Increment/Decrement status:** Clear the status of one or more serial numbers with this command.

XX   **88**   **Load Field Number to Increment by 1:** For multiple serial numbers.

XX   **89**   **Load Field Number to Decrement by 1:** For multiple serial numbers.

XX   **90**   **Piezo Beep Control:** Enter number of times to beep pieze before turning it off. This setting is used to control the number of times that the pieze beeps after an error occurs. A value of 0 will produce a continuous beep.

XX   **91**   **Load Value for Printer to See Valid Gap.** Section 5.3.

XX   **92**   **Load Value for Slices to Process:** This command adjusts the number of slices generated before the drive motor starts moving. The default is 256 and the valid range is 1 to 366.

           93   **Load Control Code Recognition Status:**
0   Enable control code recognition.
1   Disable control code recognition.

           94   **Piezo On/Off:**
0   Enable piezo.
1   Disable piezo.

XX   **95**   **Load User Defined Steps for Label to Advance:**

XX   **96**   **Load Advance Delay:** ^A specifies how many milliseconds to delay repositioning of the label in tag/tear and peel-and-dispense modes.

           97   **Tag/Tear Operation:**
0   Turns off tag/tear operation.
1   Advance after every label.
2   Advance after copies count.
3   Advance when idle.

           98   **Peel-and-Dispense Mode:** Sections 2.5.2 and 5.3.7
0   Turn off peel-and-dispense mode.
1   Turn on peel-and dispense mode.
2   (Custom Applicator Mode - peel and dispense with no delay.)

           99   **Cutter Control:**
0   Disable cutter.
1   Enable cutter.

           100   **Clear User RAM:** This command will clear all downloaded fonts, graphics, and stored label formats. See Section 5.3.8.

           101   **Send User RAM Available:** The printer will send the number of free bytes to the serial port (ie. >699842<).

102	**Allocate XX amount of blocks for PDF Memory:** The remaining blocks will be allocated to user memory.	
1	(256K) 1 block	
2	(512K) 5 blocks	
3	(1024K) 13 blocks	
4	(2048K) 29 blocks	

103   **User memory configuration:**

0   Send the size (in bytes) of PDF Memory to serial port 1.

1   Send the size (in bytes) of total User Memory to serial port 1. Note: This is the total size of user memory, not the size of unused User Memory, which can still be obtained by the ^D101 command.

105   **Clear fonts and graphics:** (This command is currently not implemented)

0   Clear all fonts and graphics.

1-32   Clear individual fonts and graphics. The value will determine which slot is cleared.

106   **Load Font or Graphic:** The ^A value determines which slot (1-255) the font or graphic image will be stored in.

121   **Set ^D122/^D123 retract/advance speed:** This command sets the speed at which the ^D122 and^D123 commands advance or retract media. The ^A value is specified using the print speed chart.

122   **Advance media:** This command causes the printer to advance the media. The amount is set using the ^A value. Note: The printer does not automatically retract using this command. This command is used only in special applications.

123   **Retract media:** This command causes the printer to retract the media. The amount is set using the ^A value. Note: The printer does not automatically advance using this command. This command is used only in special applications.

160   **Slew speed control:** If enabled, this command will cause the printer to rapidly advance the current label when it has completed all printing.

0   Disable slew

1   Enable slew

161   **RAM checksum control:** If enabled, this command will cause the printer to verify the integrity of internal user RAM. The RAM checksum is updated each time that a file is stored in user RAM. This command should be enabled if the printer is equipped with the battery backed RAM option.

0   Disable RAM checksumming

1   Enable RAM checksumming

APPENDIX C: HARDWARE DIP SWITCHES (on rear panel)

Hard Switch 1

```
123456 78
XXXXXX XX
****** *.) Parallel Board Jumper Status (Must be 0 when using
****** *   firmware versions 1.65 and higher)
****** .)) 1=Parallel Board Detected
******
*****.)))0=No Parity, 1=Enable Parity (COM1)
****.))))0=Odd Parity, 1=Even Parity (COM1)
***.)))))0=8 Data Bits, 1=7 Data Bits (COM1)
**.)))))))),
*.)))))))),*
.)))))))),** Bits per Second (COM1)
         000     300 bps
         100     600 bps
         010    1200 bps
         110    2400 bps
         001    4800 bps
         101    9600 bps
         011   19200 bps
         111   38400 bps
```

Index

Notes