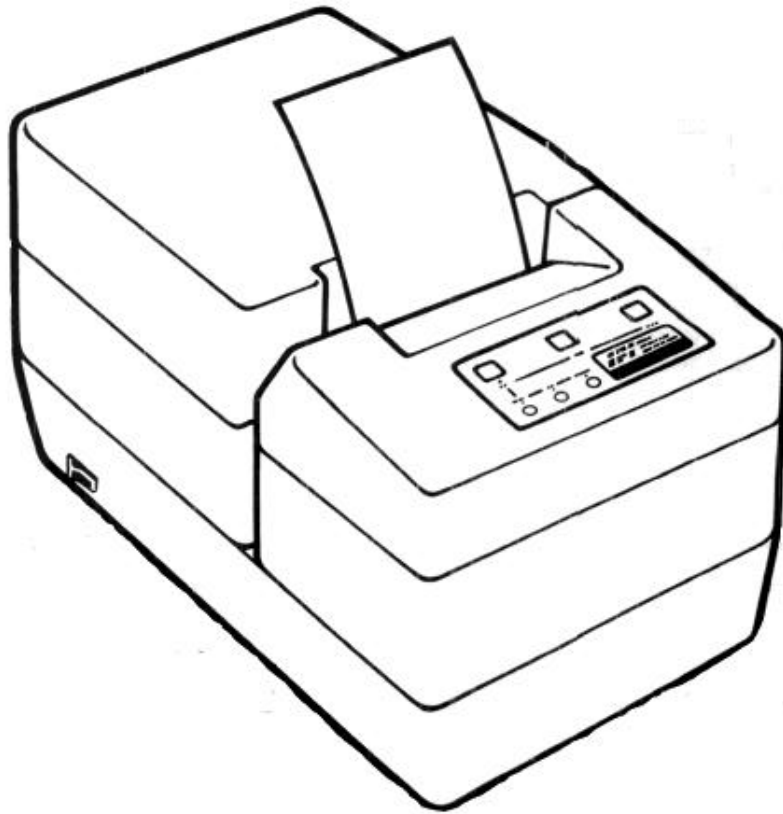


MODEL 50PLUS

Programmer's Guide



Ithaca Peripherals

# Ithaca Peripherals

Programmers Guide for:

Model 50PLUS Receipt Printer

Model 50PLUS Receipt/Journal Printer

Model 50PLUS Receipt/Journal/Validation Printer

Model 50PLUS Receipt/Validation Printer

Model 50PLUS Receipt & Receipt/Journal Printer w/Auto-Cut Option

**Standard Emulations: Okidata 172 & IBM Proprinter XL**

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**SCOPE**

This technical reference and programming manual provides the commands and code formats needed to program the host computer's operating software to control an Ithaca Series 50 Printer. Detailed Command code formats and descriptions are provided which allow the Series 50 printer to emulate other printer operations. Also included are specifications for the computer to printer communications cables.

### **SPECIAL NOTICE**

When this publication was written, every effort was made to ensure that information in this document was complete, accurate and up to date. Ithaca Peripherals assumes no responsibility for errors beyond it's control. Ithaca Peripherals also cannot guarantee that changes in software and equipment made by other manufacturers, and referred to in this handbook, does not affect the applicability of the information in this manual.

If the dealer cannot answer questions, please feel free to call our office at (607)257-8901 and ask for Technical Support.

If a unit needs to be shipped to the depot for repairs, return it in the original packing material and shipping container. It is recommended that one set of packing material be saved for this purpose. Before returning the unit, call Field Engineering at (607)257-8901 and they will assign a RMA # and give you shipping instructions.

**CAUTION  
RISK OF ELECTRICAL SHOCK  
DO NOT OPEN**

**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE  
BOTTOM OF PRINTER.  
NO-USER SERVICEABLE PARTS INSIDE**

**REFER SERVICING TO QUALIFIED SERVICE PERSONNEL**

**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS  
PRINTER TO RAIN OR MOISTURE.**

**FEDERAL COMMUNICATIONS COMMISSION  
RADIO FREQUENCY INTERFERENCE**

**STATEMENT****WARNING**

This equipment complies with the limits for a Class A computing device in accordance with the specifications in Part 15 of FCC Rules which are designed to minimize radio frequency interference in the installation; however, there is no guarantee that radio or television interference will not occur in any particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on while the radio or television is on, the user is encouraged to try to correct the interference by one or more of the following measures:

- \* Reorient the radio or television receiving antenna;
- \* Relocate the printer with respect to the receiver;
- \* Move the printer away from the receiver; or
- \* Plug the printer into a different outlet so that the printer and the receiver are on different outlets.

If necessary the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communication Commission helpful: "How to Identify and Resolve Radio/TV Interference Problems". This booklet is available from the U.S. government Printing Office Washington, DC 20402. Order stock number 004-000-00345-4.

**CANADIAN DEPARTMENT OF COMMUNICATIONS  
RADIO INTERFERENCE STATEMENT**

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

**UL and VDE STATEMENT**

Ithaca Peripherals Series 50PLUS printers are UL Listed, CSA Listed, and VDE Certified.

**INTERNAL PROGRAMMING**

**FUNCTION SWITCH POSITIONS AND DESCRIPTIONS**

DIP switch pack function switch positions are firmware dependent. Switch positions for printers are provided with each emulation table. Refer to the emulation that you are using for the proper switch settings.

To change a switch position, do the following:

1. Disconnect the printer from AC power.
2. Turn printer upside down and remove switch access cover.
3. Using a thin tipped instrument (ballpoint pen, narrow blade screwdriver) slide the segment of the DIP switch pack to the ON or OFF position.
4. Replace the switch access cover. Reconnect the printer to AC power.

**PROGRAMMING THE PRINTER**

The special features (such as receipt format, graphics, subscripts, superscripts, enhanced and emphasized printing) of the Ithaca PcOS Series 50 printers are controlled through the host computer's software operating program.

The commands needed to implement all selected features are provided in four software operating formats (if applicable) for each printer emulation program. The programming formats are presented in two forms; a table of operating codes with descriptions, considerations and a corresponding quick reference chart. All features that can be implemented are listed. For future reference, check off those commands that are selected during the initial set-up and at any other subsequent programming.

**POWER ON CHARACTERISTICS**

When power is applied (Power switch set to the on position), the printer automatically sets up with the following print format characteristics:

- \* 17 characters per inch (40 columns)
- \* 8 lines per inch
- \* Horizontal tabs at every 8th column
- \* Vertical tabs at one inch intervals
- \* Character set selected by the control board DIP switch pack switch settings
- \* These print characteristics remain set until changed by commands from the host computer.

**PROGRAMMING CODE FORMAT EXAMPLES**

The commands are given in the following different code formats (ASCII, DECIMAL, HEXADECIMAL, and PCL). As shown below, the commands codes vary in degrees of complexity. The most complex commands have parameters which vary with each specific application. Further explanation is provided with each specific command in the Emulation Programming Codes and Description Tables. Since not all commands are applicable for all printer emulations, each table indicates for which printer emulation the command is active.

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC 1	27 45 49	1B 2E 31	&%MU

**ASCII:** Standard abbreviation in ASCII-used for reference.

**DECIMAL:** Decimal code represented in the format most often used.

**HEXADECIMAL:** Hexadecimal code used by some software packages to enter printing commands.

**PCL:** Printer Control Language(PCL) is an alternate command set consisting of printable character strings. Because some systems are unable to send certain sequences, such as escape sequences or HEX codes lower than 20, PCL allows these systems to communicate with the printer. If you are using the PcOS Model 53PLUS printer and software handshaking (XON/XOFF), use the PCL codes for the validation sequence.

PCL commands consist of a string of four characters in this format:  
&%XX.

The first two characters, &%, are fixed and identify the command as a PCL string.

The last two characters, XX, are alphanumeric and define the function to be performed. If the last two characters are undefined or incorrect, the string will be treated as printable data.

**50PLUS PRINTER PROGRAMMING COMMANDS**

THE PROGRAMMING INFORMATION PROVIDED CONSISTS OF THE FOLLOWING:

**-PRINTER FUNCTION SWITCH SETTINGS**

**-CONTROL CODE AND ESCAPE SEQUENCE QUICK REFERENCE CHART**

**-CONTROL CODES AND ESCAPE SEQUENCES EXPLAINED**

### **50PLUS PRINTER FUNCTION SWITCH SETTINGS**

#### **CHECK AND SET SWITCHES**

The factory switch settings apply to most customer applications and normally do not need

to be reset; however, the switch settings should be checked and set at this time, if necessary.



**CONTROL BOARD**

All 50PLUS printers contain one large circuit board called the control board. Located on that board is one DIP switch pack containing 8 switches (called DIP SW on the circuit board).

1	2	3	4	5	6	7	8
OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF

**SWITCHES 1 & 2**

When this unit is shipped from the factory, the switches are set so that the unit prints US ASCII characters and the numeric 0 without a slash through it. The following table shows the available languages and switch settings.

LANGUAGE	SW1	SW2
American (slash zero)	OFF	OFF
American (no slash zero)	OFF	ON
French Canadian	ON	OFF
Spanish	ON	ON

**SWITCH 3**

Switch 3 controls the automatic line feed. It is set in the OFF position because most configurations of personal computers automatically send a line feed to the printer after the carriage return at the end of each line. If your configuration doesn't send a line feed at the end of each line, switch 3 can be set to the ON position to provide the line feed automatically. If your PC configuration does provide an automatic line feed, switch 3 can be used to provide automatic double spacing.

**SWITCH 4**

Switch 4 is used to select the takeup function of receipt/journal and receipt/journal/validation printers. With switch 4 ON, the journal takeup is disabled and with switch 4 Off, the takeup is enabled. The factory setting is OFF.

**SWITCH 5**

Switch 5 is used by the factory and should remain in the factory setting (OFF).

**SWITCH 6**

Switch 6 disables the 10 CPI print mode. With switch 6 in the ON position the printer will ignore the 10 CPI command (DC2) and will remain at the default setting of 17.1 CPI. Setting switch 6 to the OFF position enables the 10 CPI command. The factory setting is OFF.

**SWITCH 7**

Switch 7 selects the character set. This switch is factory set in the OFF position and establishes Character Set 1 as the default character set. In the ON position, Character set II, the IBM Graphics printer compatible character set is established as the default character set.

**SWITCH 8**

Select emulation:

- ON = Microline
- OFF = IBM.

## 50PLUS PRINTER FUNCTION SWITCH SETTINGS-CONT.

### SERIAL COMMUNICATION BOARD (RS232C)

This optional serial interface consists of a piggy-back circuit board. After the access cover is removed, this circuit board is closest to the access opening. This board contains two DIP switch packs with a total of 16 function switches (8 switches per pack). The following shows the factory switch settings.

#### SW1

1	2	3	4	5	6	7	8
ON	ON	ON	ON	ON	ON	ON	ON

#### SW2

1	2	3	4	5	6	7	8
OFF	ON	ON	OFF	ON	ON	ON	OFF

### SWITCHES 1 & 2 (SW1)

These switches work together to set the parity of the printer to match the parity of the computer system. The factory switch setting is for NO parity.

SWITCH	SWITCH 1	SWITCH 2
NO PARITY	ON/OFF	ON
EVEN PARITY	OFF	OFF
ODD PARITY	ON	OFF

**NOTE:** 7-bit No Parity is not a true 7-bit mode, it is 7-bit but does not care about parity. The parity bit must be present or the host must be configured for 7 bits with 2 stop bits.

### SWITCH 3 (SW1)

This switch is set ON at the factory to select 8-bit data. Set this switch OFF for 7-bit data.

### SWITCH 4 (SW1)

This switch is set ON at the factory for Printer Ready/Busy protocol. Set this switch OFF in the computer uses XON/XOFF protocol.

### SWITCHES 5 & 6 (SW1)

These switches work together to run two serial cable tests. One test checks for proper switch settings, the other test checks the data cable to see if it is communicating properly. The factory setting is the non-test mode, called the print mode. See Diagnostic Tests paragraph for a description of the circuit and monitor tests.

SELECTION	SWITCH 5	SWITCH 6
PRINT MODE	ON/OFF	ON
CIRCUIT MODE	ON	OFF
MONITOR TEST	OFF	OFF

### SWITCHES 7 & 8 (SW1)

If the READY/BUSY protocol is selected (switch 4), then the line on which the printer sends the busy signal and the signal polarity (low or high) may be selected by setting switches 7 & 8. The switches are set at the factory for a negative (low) Busy signal on pin 20 (DTR).

SELECTION	SWITCH 7	SWITCH 8
DTR PIN #20 (-9v)	ON	ON
RTS PIN #4 (-9v)	ON	OFF
SSD PIN #11 (-9v)	OFF	ON
SSD PIN #11 (+9v)	OFF	OFF

## 50PLUS PRINTER FUNCTION SWITCH SETTINGS-CONT

**SWITCHES 1, 2, and 3 (SW2)**

These switches work together to select the transmission speed (baud rate). The switches are factory set for 9600 baud.

SELECTION	SWITCH 1	SWITCH 2	SWITCH 3
19200	ON	ON	ON
9600	OFF	ON	ON
4800	ON	OFF	ON
2400	OFF	OFF	ON
1200	ON	ON	OFF
600	OFF	ON	OFF
300	ON	OFF	OFF
110	OFF	OFF	OFF

**SWITCH 4 (SW2)**

If the printer has pin #6, DSR, connected to the computer, then set this switch to the on position. If the computer does not use the DSR signal, then leave this switch in the OFF position.

**SWITCH 5 (SW2)**

This switch is factory set to ON so that the printer waits until the print buffer has room for only 32 more bytes before sending a busy signal to the computer. If some data is lost during transmission, set this switch OFF. Then the printer sends a busy signal when room for 256 more characters remain in the print buffer.

**SWITCH 6 (SW2)**

This switch is set ON at the factory for a 200 ms busy time. This is the period of time it takes the printer to empty the print buffer and get ready to receive data. If the computer requires more time to process a response set this switch to the OFF position for a one second busy time. This situation normally occurs when the printer is not connected directly to the host computer.

**SWITCHES 7 AND 8 (SW2)**

These switches work together to control the Multidrop Communications Mode. On printers not equipped with the Multidrop Option, leave

the switches in the factory setting, 7 on and 8 off.

The settings are as follows:

SELECTION	SWITCH 7	SWITCH 8
Multidrop Disabled (Printer always selected)	ON	ON
Multidrop Address "A"	OFF	ON
Multidrop Address "B"	ON	OFF
Multidrop Address "C"	OFF	OFF

**The Multidrop option must be present before you can utilize these switch settings. Contact Customer Service if you are unsure if this option is present.**

**OKIDATA MICROLINE EMULATION PRINTER COMMANDS**

FEATURE DESCRIPTION					
ASCII	DECIMAL	HEXADECIMAL	PCL	PAGE #	
<b>CARRIAGE RETURN</b>					
CR	13	0D	&%CR	16	
<b>LINE FEED</b>					
LF	10	0A	&%LF	16	
<b>PERFORM FINE LINE FEED</b>					
ESC % 5 n	27 37 53 m	1B 25 35 n	N/A	16	
<b>UNIDIRECTIONAL PRINTING</b>					
ESC -	27 25	1B 2D	N/A	16	
<b>BIDIRECTIONAL PRINTING</b>					
ESC =	27 61	1B 3D	N/A	16	
<b>HORIZONTAL TABS -SET TABS</b>					
ESC HT n1..n2	27 9 n1..n2	1B 09 n1..n2	N/A	16	
<b>-SKIP TO NEXT TAB STOP</b>					
HT	9	09	&%HT	16	
<b>LINE SPACING -SET 6 LINES PER INCH</b>					
ESC 6	27 54	1B 36	N/A	16	
<b>-SET 8 LINES PER INCH</b>					
ESC 8	27 56	1B 38	N/A	16	
<b>-SET FINE LINE SPACING</b>					
ESC % 9 n	27 37 57 n	1B 25 39	N/A	16	
<b>SET CHARACTER SIZE -START 10 CPI</b>					
RS	30	1E	&%F3	17	
<b>-START 12 CPI</b>					
FS	28	1C	&%F2	17	
<b>-START 17.1 CPI</b>					
GS	29	1D	&%F1	17	
<b>-START DOUBLE WIDTH</b>					
US	31	1F	&%MW	17	
<b>BUSY UNTIL BUFFER EMPTY &amp; CASH DRAWER CLOSED</b>					
EOT	4	04	N/A	19	

OKIDATA MICROLINE EMULATION PRINTER COMMANDS

FEATURE DESCRIPTION				
ASCII	DECIMAL	HEXADECIMAL	PCL	PAGE #
<b>OPERATE CASH DRAWER 1</b>				
BEL	7	07	&%DF	18
ESC +	27 43	1B 2B	&%D1	18
<b>OPERATE CASH DRAWER 2</b>				
BS	8	08	&%D2	18
<pre>       ςς       ςς     </pre>				
<b>REQUEST STATUS</b>				
<b>PARALLEL -STATUS REQUEST</b>				
ENQ	5	05	N/A	18
<b>SERIAL ONLY -DISABLE STATUS BYTE</b>				
ESC y 0	27 121 48	1B 79 30	N/A	18
<b>SERIAL ONLY -ENABLE STATUS BYTE</b>				
ESC y 1	27 121 49	1B 79 31	N/A	18
<pre>       ςς       ςς     </pre>				
<b>SET FORM LENGTH IN LINES</b>				
ESC F nn	27 70 nn	1B 46 nn	&%Mfnn	17
<b>INHIBIT FORM FEED-SETS FORM LENGTH TO 0</b>				
ESC F 00	27 70 00	1B 46 00	&%MF00	17
<pre>       ςς       ςς     </pre>				
<b>ADVANCE TO TOP OF NEXT FORM</b>				
FF	12	0C	&%FF	17
<pre>       ςς       ςς     </pre>				
<b>VERTICAL TAB -ADVANCE TO NEXT TAB</b>				
VT	11	0B	&%VT	20
<pre>       ςς       ςς     </pre>				
<b>UNDERLINING -START (UTILITY &amp; NLQ MODES ONLY)</b>				
ESC C	27 67	1B 43	&%MU	17
<b>-STOP</b>				
ESC D	27 68	1B 44	&%CU	17
<pre>       ςς       ςς     </pre>				
<b>SUPERSCRIPT -START</b>				
ESC J	27 74	1B 4A	&%MP	18
<b>-STOP</b>				
ESC M	27 77	1B 4D	&%CP	18
<b>SUBSCRIPT -START</b>				
ESC N	27 78	1B 4E	&%MS	18
<b>-STOP</b>				
ESC M	27 77	1B 4D	&%CS	18
<pre>       ςς       ςς     </pre>				
<b>EMPHASIZED PRINTING-START (UTILITY 10/12 CPI MODE ONLY)</b>				









CARRIAGE RETURN AND LINEFEED

ASCII	DECIMAL	HEXADECIMAL	PCL
CR	13	0D	&%CR

-performs a carriage return

The carriage return command informs the printer to print the line of data, but does not cause a line feed unless internal switch 6 is on. (See Installation and Setup Procedures earlier in this manual.)

ASCII	DECIMAL	HEXADECIMAL	PCL
LF	10	0A	&%LF

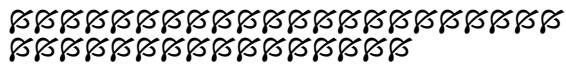
-performs a line feed

Line feed advances the paper one line.

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC % 5 n	27 37 53 n	1B 25 35 n	N/A

-performs line spacing between 1/144 and 127/144 inches

n is actually n/144 inches where n is any number between 1 and 127. Therefore if a 1/2 inch line space was selected, n would be 72. Upon receipt of this command, the printer performs the requested line feed and a carriage return. n is not an ASCII representation, but an absolute value for this command.

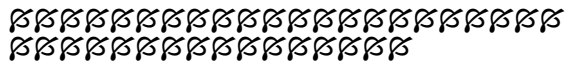


UNIDIRECTIONAL PRINTING

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC -	27 45	1B 2D	N/A

-begin unidirectional printing

Performs printing from left to right only to increase the accuracy of the left margin.



BIDIRECTIONAL PRINTING

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC =	27 61	1B 3D	N/A

-begin bidirectional printing

Performs printing in both directions for faster throughput.

HORIZONTAL TABS

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC HT n	27 9 n	1B 09	N/A

-sets horizontal tab stops

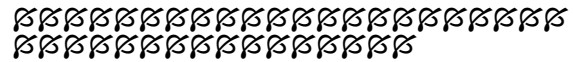
Set horizontal tab stops where n is the location of each tab stop. For example, if tab stops are to be located at every 7th column, the command would be ESC HT 7. The value for n is not an ASCII representation, but an absolute value for this command. The location of the tab stops between 1 and 40 varies directly with the character size.

If no horizontal tab command is given, the tab stops are set at every 8th column.

ASCII	DECIMAL	HEXADECIMAL	PCL
HT	9	09	N/A

-skip to next horizontal tab stop

This command causes a skip to the next tab position. The command is ignored if it exceeds the right margin or the maximum number of settings.



LINE SPACING

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC 6	27 54	1B 36	N/A
ESC 8	27 56	1B 38	N/A
ESC % 9 n	27 37 57 n	1B 25 39 n	N/A

-set 6 lpi  
-set 8 lpi  
-sets fine line feeds

n is actually n/144 inches where n is any number between 1 and 127. Therefore, if a 1/2 inch line space was desired, then n would be 72. The other commands, ESC 6 and ESC 8, set the line spacing to 6 (lpi) lines per inch and 8 (lpi) respectively. Thereafter any time the printer performs a line feed it will be at the preprogrammed setting, 6 lpi, 8 lpi, or whatever fine line spacing you've selected.

SET FORM LENGTH IN LINES

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC F nn	27 70 nn	1B 46 nn	&%Mfnn
ESC F 00	27 70 00	1B 46 00	&%MF00

-tells the printer the length of the page  
-sets form length to 0, inhibits form feed

nn is a two digit number between 01 and 99 lines on a page. When nothing is programmed, the form length is set at 66 lines per page. When nn is 00, the form length is set to 0 and form feeds are inhibited. Note; n is an ASCII representation for this command.

This command also sets the top margin on the page and the top line for the one-inch vertical-tab settings. (See Vertical Tabs).

▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯  
 ▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯

ADVANCE TO THE TOP OF NEXT FORM

ASCII	DECIMAL	HEXADECIMAL	PCL
FF	12	0C	&%FF

-causes paper to advance one form length

Prints data in the print buffer then advances paper to the top of the next receipt.

▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯  
 ▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯▯

UNDERLINING

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC C	27 67	1B 43	&%MU

-begin underlining

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC D	27 68	1B 44	&%CU

-stop underlining

Use the ESC C command to start underlining a word or a group of words. Use the ESC D command to stop underlining. The printer continues to underline until the command is given to stop it (either ESC D or CAN). Underlining is available in the utility or NLQ modes only.

You cannot underline in HSD, block graphics, APA graphics, or under the spaces designated by horizontal tabs.

SET CHARACTER SIZE

ASCII	DECIMAL	HEXADECIMAL	PCL
RS	30	1E	&%F3

-10 cpi

ASCII	DECIMAL	HEXADECIMAL	PCL
FS	28	1C	&%F2

-12 cpi

ASCII	DECIMAL	HEXADECIMAL	PCL
GS	29	1D	&%F1

17.1 cpi

ASCII	DECIMAL	HEXADECIMAL	PCL
US	31	1F	&%MW

-Double width

The character size switches to 10 cpi (characters per inch) after the printer receives the RS command. The character size becomes 12 cpi when the FS command is received and 17.1 cpi when the GS command is received.

You can double the width of 10, 12 and 17.1 cpi by inserting the US command after the character size you want doubled. To double the 10 cpi to 5 cpi, send a RS US command. To Double 12 cpi to 6 cpi, send a FS US command, and to double 17.1 to 8.5 cpi, use the GS US command. To return to single width characters, issue the appropriate size command (RS,FS, or GS). Character size can be changed in the middle of a line. The following table lists the maximum number of characters for each character size.

SUBSCRIPTS AND SUPERSCRIPTS

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC J	27 74	1B 4A	&%MP

-print superscripts

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC M	27 77	1B 4D	&%CP

-stop superscripts

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC N	27 78	1B 4E	&%MS

-print subscripts

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC M	27 77	1B 4D	&%CS

-stop subscripts

In order to print superscript characters (characters appearing above the normal print line), the ESC J command must be sent before the characters, symbols, or word(s) to be printed in superscript. To return to printing on the normal printline, the ESC M command.

In order to print subscript characters (characters appearing below the normal print line), the ESC N command must be sent before the characters, symbols, or word(s) to be printed as subscripts. To return to printing on the normal print line, use the ESC M command.

Block graphics example consisting of two rows of characters.

EMPHASIZED AND ENHANCED PRINTING

Table with 4 columns: ASCII, DECIMAL, HEXADECIMAL, PCL. Rows include ESC H (enhanced), ESC I (normal), and ESC T (emphasized).

Enhanced printing provides a deeper resolution of each character because each character is printed twice by shifting the dot positions vertically.

Emphasized printing, obtained by entering the ESC T command, causes each character to be printed by shifting the dots horizontally, thus creating a bolder image.

To return to the normal print mode when in emphasized or enhanced mode, enter the ESC I or CAN command.

Enhanced and emphasized printing may be done simultaneously for special effects.

Block graphics example consisting of two rows of characters.

OPERATE CASH DRAWER 1

Table with 4 columns: ASCII, DECIMAL, HEXADECIMAL, PCL.

Table with 4 columns: ASCII, DECIMAL, HEXADECIMAL, PCL. Includes BEL 7 07 &%D1 and ESC + 27 43 1B 2B &%D1 -fire cash drawer 1.

These commands are used to open an attached cash drawer. The printer will open the cash drawer with either of these commands.

Block graphics example consisting of two rows of characters.

OPERATE CASH DRAWER 2

Table with 4 columns: ASCII, DECIMAL, HEXADECIMAL, PCL. Includes BS 8 08 &%D2 -fire cash drawer 2.

This commands opens cash drawer 2 and requires the dual cash drawer option (BNC CONNECTORS ONLY).

Block graphics example consisting of two rows of characters.

STATUS REQUEST/ENABLE/DISABLE

Table with 4 columns: ASCII, DECIMAL, HEXADECIMAL, PCL. Includes ENQ 5 05 N/A -request status SERIAL ONLY and ESC y 1 27 121 49 1B 79 30 N/A -enable status.

BUSY UNTIL BUFFER EMPTY & CASH DRAWER CLOSED

Table with 4 columns: ASCII, DECIMAL, HEXADECIMAL, PCL. Includes EOT 4 04 N/A -sets printer busy.

This command causes the printer to immediately set the communications interface busy. The printer will remain in the busy state until the communications buffer has been emptied and the cash drawer has been closed (status option required). 2K BUFFER REQUIRED

XX  
XX

COMMUNICATIONS ECHO MODE

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC #	27 35	1B 23	N/A
-echo mode on			
ESC d	27 100	1B 64	N/A
-alternate echo mode on			
ESC "	27 34	1B 22	N/A
-echo mode off			
ESC RS	27 30	1B 1E	N/A
-alternate echo mode off			

After the ECHO MODE ON command is received all subsequent data received by the printer on pin 3 of the serial interface will not be printed but will be re-transmitted on pin 2. The printer will remain in the echo mode until the ECHO MODE OFF command is received. The baud rate, parity, etc of the echoed data will be the same as that of the received data. REQUIRES PASS THRU OPTION AND THE SERIAL INTERFACE

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INITIATE SELF TEST

ASCII	DECIMAL	HEXADECIMAL	PCL
N/A	N/A	N/A	&%IT
-causes self test			

This command causes the printer to go into the self test mode. The test pattern should print beginning with a firmware part number, the revision level, followed by a rolling character pattern. While the printer is printing, the SEL will remain off. To terminate the self test, press the SEL button on the front panel twice, or turn the printer off.

XX  
XX

CASH DRAWER STATUS-SERIAL INTERFACE:

A status byte is transmitted to the host upon receipt of the ENQ command from the host.

The status byte is defined as follows:			
LSB	FUNCTION	=0	=1
BIT 0	Validation Throat	Closed	Open
BIT 1	Buffer Status	Empty	Not Empty
BIT 2	Paper Out (Paper is)	Present	Absent

BIT 3	On Line (Printer is)	Off line	On line
BIT 4	Busy (Printer is)	Idle	Busy
BIT 5	*Slip In (Form is)	Absent	Present
BIT 6	Cash Drawer 1 Status	Closed	Open
BIT 7	Cash Drawer 2 Status	Closed	Open
MSB			

Note: The Slip In status is only valid when the validation throat is in the open position.

XX  
XX

CASH DRAWER STATUS-PARALLEL INTERFACE:

When cash drawer status sensing is enabled the PAPER OUT and SEL status lines on the parallel interface reflect the open /closed status of an attached cash drawer as follows:

Paper Out	Sel
0	0
-printer off line	0
1	0
-paper out	1
0	1
-printer on line	drawer closed
1	1
-printer on line	drawer open

The printer status transmission can be disabled by sending an ESC y 0 sequence and enabled by sending an ESC y 1. The default is status enabled.

FULL CUT

ASCII	DECIMAL	HEXADECIMAL	PCL
EM	25	19	&%FC
-causes a 360 degree rotation of the knife			

This command will cause a full 360 degree rotation of the knife and leaves the knife in the full cut park position. The command is ignored on models without the cutter feature. This command should be used only when the rotary knife is mechanically set to the full cut mode. Paper jams may occur if this

command is used when the rotary knife is mechanically set to the partial cut mode.

∂∂∂

PARTIAL CUT MODE

ASCII DECIMAL HEXADECIMAL PCL
SUB 26 1A &%PC
-causes a 360 degree rotation of the rotary knife

This command will cause a 360 degree rotation of the knife in the partial cut park position. The command is ignored on models without the cutter feature. This command should be used only when the rotary knife is mechanically set to the partial cut mode. Paper jams may occur if this command is used when the rotary knife is mechanically set to the full cut mode.

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FEED TO CUTTER

ASCII DECIMAL HEXADECIMAL PC
VT 11 0B &%VT
-feeds up from the current print line to the knife cut point

This command will feed a fixed length of paper (vertical tab) equal to the distance from the current printline to the knife cut point (approx. 1 inch). This distance is irrespective of the line spacing of the printer.

NOTE: THE FULL CUT, PARTIAL CUT AND THE FEED TO CUTTER REQUIRES THE AUTOMATIC CUTOFF OPTION. THIS OPTION IS NOT AVAILABLE ON VALIDATION MODELS

CLEAR PRINT BUFFER

ASCII DECIMAL HEXADECIMAL PCL
CAN 24 18 &%RP
-clear buffer

The cancel code clears the print buffer. This command DOES NOT clear the communications buffer.

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VERTICAL TABS

ASCII DECIMAL HEXADECIMAL PCL
VT 11 0B &%VT
-advance to next vertical tab stop

When the Series 50 printer is turned on, vertical tabs are set at 1 inch intervals. To advance to the next vertical tab, use the VT command. The vertical tabs begin at the preassigned top of page.

∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂

PRINT MODES

ASCII DECIMAL HEXADECIMAL PCL
ESC ! / 27 33 47 1B 21 2F N/A
-start italics
ESC ! \* 27 33 42 1B 21 2A N/A
-stop italics
ESC 1 27 49 1B 31 &%QL3
-start NLQ print
ESC 0 27 48 1B 30 &%QL1
-start utility print
ESC # 0 27 35 48 1B 23 30 &%QT0

The italics command causes the printer to print italic (slanted) characters. Often italics are used instead of underlining to highlight a word or phrase. Italics is available in the Utility 10 & 12 CPI modes only.

The NLQ command gives you sharp, crisp characters. The NLQ is performed with two passes of the printhead, the second pass filling in the characters more completely. The NLQ command takes the printer out of the turbo mode.

The utility command sets the printer to the standard speed mode.

PRINT MODES (con't)

The start turbo print mode resets the printer to the turbo speed mode.

∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂∂

VALIDATION OPEN (Validation Models only)

ASCII DECIMAL HEXADECIMAL PCL
ESC DC1 27 17 1B 11 &%VO
-open forms comp

This command opens the forms compensation assembly and turns on the ALM light. A form may now be inserted into the printer for up to 15 lines of validation print. The forms compensation assembly must be closed by the appropriate software command or by pressing the black square button on the front panel (printer deselected) prior to printing on the inserted form.

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▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣

VALIDATION CLOSE (Validation Models only)

ASCII    DECIMAL    HEXADECIMAL    PCL  
ESC DC3    27 19            1B 13            &%VC  
-close forms comp

This command closes the forms compensation assembly and turns off the ALM light. If the forms compensation assembly is already closed, the command is ignored.

▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣  
▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣

VALIDATION CLOSE ON SLIP INSERTION (Validation Models ONLY)

ASCII    DECIMAL    HEXADECIMAL    PCL  
ESC DC4    27 20            1B 14            &%VS  
-close forms comp on slip insertion

This command is similar to the Validation Close command except the forms compensation assembly does not close until an inserted form is sensed by the printer. The forms sensor is located at the right edge of the paper path at the bottom of the validation slot. If for any reason the form is not detected, this command can be overridden by pressing the black square button on the front panel.

▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣  
▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣

CODE 39

ASCII    DECIMAL    HEXADECIMAL    PCL  
N/A        N/A            B/A            &%39  
-PRINTS CODE 39 BAR CODES

This command is followed by the numeric data to be printed (up to 8 characters). The bar code is printed when a carriage return is detected. A

checksum character, if required, must be calculated by the host and transmitted as part of the data stream. Start and stop characters are automatically inserted by the printer.

▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣  
▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣▣

UPSIDE DOWN PRINT

ASCII    DECIMAL    HEXADECIMAL    PCL  
ESC r 2    27 72 2        1B 114 02        &%R2  
-BEGINS UPSIDE DOWN PRINT

All subsequent lines will be rotated 180 degrees and positioned at the opposite margin. This command will remain in effect until rotation is cancelled with the **End Upside Down Print** command. In the upside down mode the 10, 12, and 17 CPI spacing commands are effective. The last line of print must be terminated with a line terminator before the **End Upside Down Print** command is issued. Any characters in the print buffer that have not been printed will not be printed. They will be printed in the normal mode when a line terminator is received. This mode simply inverts and mirrors the print operation. All line spacing and print features are available.

ASCII    DECIMAL    HEXADECIMAL    PCL  
ESC r 0    27 72 0        1B 114 00        &%R0  
-ENDS UPSIDE DOWN PRINT

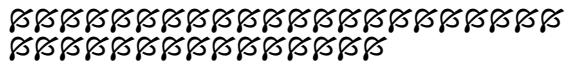
The printer will return to normal mode. Characters in the print buffer that have not been printed will not be printed.

INTERLEAVED 2 OF 5 BAR CODE

ASCII    DECIMAL    HEXADECIMAL    PCL  
N/A        N/A            B/A            &%25  
-PRINTS INTERLEAVED 2 OF 5 BAR CODES

This command is followed by the numeric data to be printed (up to 16 characters). The bar code is printed when a carriage return is detected. If the total number of digits is odd, the printer will add a leading 0 to conform to the 1 2 of 5 bar code standard. Interleaved 2 of 5 supports numeric

digits 0-9 only. Out of range characters will print as 0.

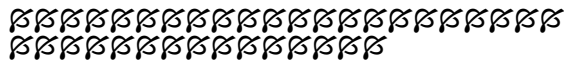


CODE 128

ASCII	DECIMAL	HEXADECIMAL	PCL
N/A	N/A	B/A	&%12

-PRINTS CODE 128 BAR CODES

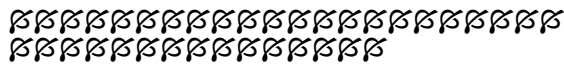
This command is followed by the numeric data to be printed (up to 8 characters). The bar code is printed when a carriage return is detected. A checksum is automatically calculated by the printer along with the stop code. The appropriate start code must be sent from the host.



APA GRAPHICS

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC K n1..n2	27 75 n1..N2	1B 4B n1..n2	N/A
-single density graphics			
ESC L n1..n2	27 76 n1..n2	1B 4C n1..n2	N/A
-half speed double density graphics			
ESC Y n1..n2	27 89 n1..n	1B 59 n1..n2	N/A
-full speed double density graphics			
ESC Z n1..n2	27 90 n1..n2	1B 5A n1..n2	N/A
-quadruple density graphics			

Using APA (All Points Addressable) graphics, the printer can draw any kind of illustration. The easiest method is to combine the printer's graphic capabilities with a high quality software package. This emulation will work properly with any graphics software package designed for the IBM Personal Computer and IBM graphics printers. No software modifications are required and images will be printed without distortion.



PROGRAMMING APA (Bit Image) GRAPHICS

You can also write a program that prints a graphic image directly, without transferring it from the display screen. This section explains how to do this using BASIC statements.

Your printer prints graphic images in successive columns of eight dots. The LPRINT statement that tells the printer to do this has three components:

1. The control code sequence that puts the printer into the graphics mode,
2. The number of columns of graphics to be printed, and
3. The coded information that tells the printer which dots to print in each column.

There are four modes of bit image graphics available with your printer. They differ in horizontal resolution, or density (this indicates how close together the dots are), and it's measured by the number of dots per inch (dpi). All modes have a vertical resolution of 72 dpi. For reference, the diameter of a dot is 1/72". The modes are discussed in more detail in the next section on control codes.

1. Control Codes

A graphics LPRINT statement begins with a control code that tells the printer to print a graphic image. Each graphics mode has a different control code.

ESC K CHR\$(27);CHR\$(75)	1B 4B (hex)
Single Density	60 x 72 DPI





you want to use higher density graphics, keep in mind that the columns will overlap, and remember any restrictions that may apply.) Then divide the image into strips of eight rows. Each row will be programmed as a separate LPRINT statement.

Each position in the column has a numerical value as shown in the table below. Simply add up the value of the column positions where you want a dot to appear; the total is then entered in your LPRINT statement.

#### Column Position Values

Column Position	Decimal Values	BIT
TOP		
0	128	2 <sup>7</sup>
0	64	2 <sup>6</sup>
0	32	2 <sup>5</sup>
0	16	2 <sup>4</sup>
0	8	2 <sup>3</sup>
0	4	2 <sup>2</sup>
0	2	2 <sup>1</sup>
0	1	2 <sup>0</sup>

BOTTOM

Example:

0		
0	64	
0		
0	+16	
0	+ 8	
0	+ 4	
0		
0	<u>+ 1</u>	
Enter	93	as CHR\$(93)

If we call the number for each column Cx. etc., then the complete statement would look like this:

```
LPRINT
CHR$(27);CHR$(75);CHR$(144);CHR$(1);CHR$(c1);
CHR$(c2);...;CHR$(c400)
```

#### IBM PROPRINTER XL EMULATION COMMANDS FEATURE DESCRIPTION

<u>ASCII</u>	<u>DECIMAL</u>	<u>HEXADECIMAL</u>	<u>PCL</u>	<u>PAGE #</u>
<b>CARRIAGE RETURN</b>				
CR	13	0D	&%CR	29
<b>LINE FEED</b>				

LF	10	0A	&%LF	29
<b>FINE LINE FEED</b>				
ESC J n	27 74 n	1B 4A n	N/A	29
_____ _____ <b>UNIDIRECTIONAL PRINTING</b> _____				
ESC U 1	27 85 49	1B 57 31	N/A	29
<b>BIDIRECTIONAL PRINTING</b>				
ESC U 0	27 85 48	1B 57 30	N/A	29
_____ _____ <b>HORIZONTAL TABS -SET TABS</b> _____				
ESC D n1..n2	27 6B n1..n2	1B 44 n1..n2	N/A	29
-SKIP TO NEXT TAB STOP				
HT	9	09	&%HT	29
_____ _____ _____				
<b>LINE SPACING -SET 6 LINES PER INCH</b>				
ESC A 12 ESC 2	27 65 12 27 50	1B 41 0C 1B 32	N/A	30
<b>-SET 8 LINES PER INCH</b>				
ESC 0	27 48	1B 30	N/A	30
<b>-SET FINE LINE SPACING (n/216" INCREMENTS)</b>				
ESC 3 n	27 51 n	1B 33 n	N/A	30
<b>-SET FINE LINE SPACING (n/72" INCREMENTS)</b>				
ESC A n ESC 2	27 74 n 27 50	1B 4A n 1B 32	N/A	30
_____ _____				
<b>SET CHARACTER SIZE -START 10 CPI</b>				
DC2	18	12	&%F3	30
<b>-START 12 CPI</b>				
ESC :	27 58	1B 3A	&%F2	30
<b>-START 17.1 CPI</b>				
SI	15	0F	&%F1	30
<b>-PRINT CURRENT FONT DOUBLE WIDTH</b>				
ESC W 1	27 87 49	1B 57 31	N/A	30
<b>-EXIT DOUBLE WIDE MODE</b>				
ESC W 0	27 87 48	1B 57 30	N/A	30
<b>-START ONE LINE DOUBLE WIDE</b>				
SO	14	0E	&%MW	30
<b>-STOP ONE LINE DOUBLE WIDE</b>				
DC4	20	14	&%MN	30
_____ _____				
<b>SELECT IBM CHARACTER SET I</b>				
ESC 7	27 55	1B 37	N/A	33
<b>SELECT IBM CHARACTER SET II</b>				
ESC 6	27 54	1B 36	N/A	33

**IBM PROPRINTER XL EMULATION COMMANDS  
FEATURE DESCRIPTION**



ESC Y n1..n2 27 89 n1..n2 1B 59 n1..n2 N/A 36

**IBM PROPRINTER XL EMULATION COMMANDS  
FEATURE DESCRIPTION**

<u>ASCII</u>	<u>DECIMAL</u>	<u>HEXADECIMAL</u>	<u>PCL</u>	<u>PAGE #</u>
<b>APA GRAPHICS -QUADRUPLE DENSITY GRAPHICS</b>				
ESC Z n1..n2	27 90 n1..n2	1B 5A n1..n2	N/A	36
XX				
XX				
<b>INITIATE SELF TEST</b>				
N/A	N/A	N/A	&%IT	32
XX				
XX				
<b>PRINT MODES -START ITALICS (UTILITY 10/12 CPI MODE ONLY)</b>				
ESC % G	27 37 71	1B 25 47	N/A	31
<b>-STOP ITALICS</b>				
ESC % H	27 37 72	1B 25 48	N/A	31
<b>-START NLQ PRINT MODE</b>				
ESC I 3	27 73 51	1B 49 33	&%QL3	31
<b>-START UTILITY PRINT MODE</b>				
ESC I 1	27 73 49	1B 49 31	&%QU1	31
<b>-START TURBO PRINT MODE</b>				
ESC # 0	27 35 48	1B 23 30	&%QT0	31
XX				
XX				
<b>PERFORM VALIDATION -OPEN ASSEMBLY</b>				
ESC DC1	27 17	1B 11	&%VO	33
<b>-CLOSE ASSEMBLY</b>				
ESC DC3	27 19	1B 13	&%VC	33
<b>-CLOSE ASSEMBLY WHEN FORM SENSED</b>				
ESC DC4	27 20	1B 14	&%VS	33
XX				
XX				
<b>AUTO CUTTER -FULL CUT</b>				
EM	25	19	&%FC	35
<b>-PARTIAL CUT</b>				
SUB	26	1A	&%PC	35
<b>-FEED TO CUTTER</b>				
VT	11	0B	&%VT	35
XX				
XX				
<b>COMMUNICATIONS ECHO MODE</b>				
<b>-ECHO MODE ON</b>				
ESC #	27 35	1B 23	N/A	32
<b>-ALTERNATE ECHO MODE ON</b>				
ESC d	27 100	1B 64	N/A	32
<b>-ECHO MODE OFF</b>				
ESC "	27 34	1B 22	N/A	32
<b>-ALTERNATE ECHO MODE OFF</b>				

ESC RS	27 30	1B 1E	N/A	32
<pre> XX XX           </pre>				
<b>BUSY UNTIL BUFFER EMPTY &amp; CASH DRAWER CLOSED</b>				
EOT	4	04	N/A	33

**IBM PROPRINTER XL EMULATION COMMANDS  
FEATURE DESCRIPTION**

<u>ASCII</u>	<u>DECIMAL</u>	<u>HEXADECIMAL</u>	<u>PCL</u>	<u>PAGE #</u>
<b>OPEN CASH DRAWER 1</b>				
BEL	7	07	&%DF	34
<b>OPEN CASH DRAWER 2</b>				
BS	8	08	&%D2	34
<pre> XX XX           </pre>				
<b>REQUEST STATUS</b>				
PARALLEL <b>-ENABLE</b>				
ENQ	5	05	N/A	35
PARALLEL <b>-DISABLE</b>				
ACK	6	06	N/A	35
SERIAL ONLY <b>-DISABLE</b> STATUS BYTE				
ESC y 0	27 121 48	1B 79 30	N/A	34
SERIAL ONLY <b>-ENABLE</b> STATUS BYTE				
ESC y 1	27 121 49	1B 79 31	N/A	34
<pre> XX XX           </pre>				
<b>UPSIDE DOWN PRINT</b>				
<b>-BEGIN</b>				
ESC r 2	27 114 2	1B 72 02	&%R2	32
<b>-END</b>				
ESC r 0	27 114 0	1B 72 00	&%R0	32
<pre> XX XX           </pre>				
<b>PRINT BAR CODES</b>				
<b>-INTERLEAVED 2 OF 5</b>				
N/A	N/A	N/A	&%25	34
<b>-CODE 39</b>				
N/A	N/A	N/A	&%39	34
<b>-CODE 128</b>				
N/A	N/A	N/A	&%12	34

CARRIAGE RETURN AND LINEFEED

ASCII	DECIMAL	HEXADECIMAL	PCL
CR	13	0D	&%CR

-performs a carriage return

The carriage return command informs the printer to print the line of data, but does not cause a line feed unless internal switch 6 is on. (See Installation and Setup Procedures earlier in this manual.)

ASCII	DECIMAL	HEXADECIMAL	PCL
LF	10	0A	&%LF

-performs a line feed

Line feed advances the paper one line.

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC J n	27 74 n	1B 4A n	N/A

-performs line spacing between 1/216 and 255/216 inches

Where n equals a number from 1 to 255, the ESC J command allows you to interrupt the set line spacing and reset the line spacing for a single line in a multiple of 1/216". You can select a maximum space setting of 255/216", which is equivalent to 1 39/216" line space. Upon receipt of the ESC J n, the printer prints out the line containing the command and advances the paper the distance specified by the command. If the ESC J n is at the beginning of the line, a line feed occurs and the line prints. If the ESC J n is at the end of the line, the line will print and then line feed. Line spacing then returns to the previous setting, and the printer continues to print.

XX  
XX

UNIDIRECTIONAL PRINTING

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC U 1	27 85 49	1B 57 31	N/A

-begin unidirectional printing

Performs printing from left to right only to increase the accuracy of the left margin.

BIDIRECTIONAL PRINTING

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC U 0	27 85 48	1B 57 30	N/A

-begin bidirectional printing

Performs printing in both directions for faster throughput.

ADVANCE TO THE TOP OF NEXT FORM

ASCII	DECIMAL	HEXADECIMAL	PCL
FF	12	0C	&%FF

-causes paper to advance one form length

Prints data in the print buffer then advances paper to the top of the next receipt.

XX  
XX

HORIZONTAL TABS

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC D n1..n2	27 6B n1..n2	1B 44 n1..n2	N/A

-sets horizontal tab stops

Set horizontal tab stops where n is the location of each tab stop. For example, if tab stops are to be located at every 7th column, the command would be ESC HT 7. The value for n is not an ASCII representation, but an absolute value for this command. The location of the tab stops between 1 and 40 varies directly with the character size.

If no horizontal tab command is given, the tab stops are set at every 8th column.

ASCII	DECIMAL	HEXADECIMAL	PCL
HT	9	09	&%HT

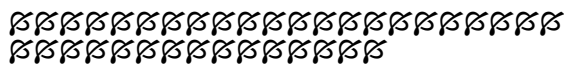
-skip to next horizontal tab stop

This command causes a skip to the next tab position. The command is ignored if it exceeds the right margin or the maximum number of settings.

LINE SPACING

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC A 12	ESC 2 27 65	12 27 50	1B 41 0C 1B 32
N/A	-set 6 lpi		
ESC 0	27 48	1B 30	N/A
	-set 8 lpi		
ESC 3 n	27 51 n	1B 33 n	N/A
	-sets fine line spacing (n/216" increments)		
ESC A n ESC 2	27 74 n 27 50	1B 4A n 1B 32	N/A
	-set fine line spacing (n/72" increments)		

n is actually n/144 inches where n is any number between 1 and 127. Therefore, if a 1/2 inch line space was desired, then n would be 72. The other commands, ESC 6 and ESC 8, set the line spacing to 6 (lpi) lines per inch and 8 (lpi) respectively. Thereafter any time the printer performs a line feed it will be at the preprogrammed setting, 6 lpi, 8 lpi, or whatever fine line spacing you've selected.



SET FORM LENGTH IN LINES

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC C n	27 67 n	1B 43 n	&%Mfn

-sets form length in lines

n is a three digit number between 01 and 127 lines on a page. When nothing is programmed, the form length is set at 66 lines per page. When n is 0, the form length is set to 0 and form feeds are inhibited. Note; n is an ASCII representation for this command.

This command also sets the top margin on the page and the top line for the one inch vertical tab settings.

SET FORM LENGTH IN INCHES

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC C 0 n	27 67 0 n	1B 43 00 n	&%MF0n

-sets form length in inches

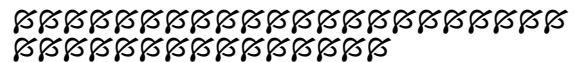
n is a two digit number between 1 and 22. When nothing is programmed, the form length is set at 11 inches. When n is 0, the form length is set to 0 and form feeds are inhibited. Note; n is an ASCII representation for this command.

This command also sets the top margin on the page and the top line for the one inch vertical tab settings.

SET FORM LENGTH TO 0, INHIBIT FORM FEED

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC C 00	27 67 00	1B 43 00	&%MF00

-sets form length to 0, inhibit form feed

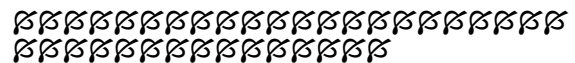


UNDERLINING

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC - 1	27 45 49	1B 2D 31	&%MU1
	-begin underlining (utility & NLQ modes only)		
ESC - 0	27 45 48	1B 2D 30	&%CU0
	-stop underlining		

Use the ESC - 1 command to start underlining a word or a group of words. Use the ESC - 0 command to stop underlining. The printer continues to underline until the command is given to stop it (either ESC - o or CAN).

You cannot underline in HSD, block graphics, APA graphics, or under the spaces designated by horizontal tabs.



SET CHARACTER SIZE

ASCII	DECIMAL	HEXADECIMAL	PCL
DC2	18	12	&%F3

-10 cpi





-start turbo print mode

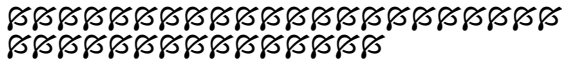
The italics command causes the printer to print italic (slanted) characters. Often italics are used instead of underlining to highlight a word or phrase.

The NLQ command gives you sharp, crisp characters. The NLQ is performed with two passes of the printhead, the second pass filling in the characters more completely. The NLQ command takes the printer out of the turbo mode.

PRINT MODES (CON'T)

The utility command sets the printer to the standard speed mode.

The start turbo print mode resets the printer to the turbo speed mode.

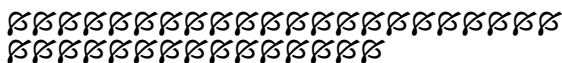


COMMUNICATIONS ECHO MODE

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC #	27 35	1B 23	N/A
-echo mode on			
ESC d	27 100	1B 64	N/A
-alternate echo mode on			
ESC "	27 34	1B 22	N/A
-echo mode off			
ESC RS	27 30	1B 1E	N/A
-alternate echo mode off			

After the ECHO MODE ON command is received all subsequent data received by the printer on pin 3 of the serial interface will not be printed but will be re-transmitted on pin 2. The printer will remain in the echo mode until the ECHO MODE OFF command is received. The baud rate, parity, etc of the echoed data will be the same as that of the received data.

REQUIRES PASS THRU OPTION AND THE SERIAL INTERFACE



VERTICAL TABS

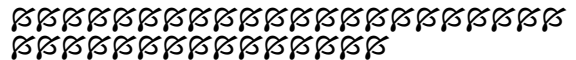
ASCII	DECIMAL	HEXADECIMAL	PCL
VT	11	0B	&%VT
-advance to next vertical tab stop			

When the Series 50PLUS printer is turned on, vertical tabs are set at 1 inch intervals. To advance to the next vertical tab, use the VT command. The vertical tabs begin at the preassigned top of page.

INITIATE SELF TEST

ASCII	DECIMAL	HEXADECIMAL	PCL
N/A	N/A	N/A	&%IT
-causes self test			

This command causes the printer to go into the self test mode. The test pattern should print beginning with a firmware part number, the revision level, followed by a rolling character pattern. While the printer is printing, the SEL will remain off. To terminate the self test, press the SEL button on the front panel twice, or turn the printer off.



UPSIDE DOWN PRINT

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC r 2	27 72 2	1B 114 02	&%R2
-BEGINS UPSIDE DOWN PRINT			

All subsequent lines will be rotated 180 degrees and positioned at the opposite margin. This command will remain in effect until rotation is cancelled with the **End Upside Down Print** command. In the rotated 180 degree mode the 10, 12, and 17 CPI spacing commands are effective. The last line of print must be terminated with a line terminator before the **End Upside Down Print** command is issued. Any characters in the print buffer that have not been printed will not be printed. They will be printed in the normal mode when a line terminator is received. This mode simply inverts and mirrors the print operation. All line spacing and print features are available.

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC r 0	27 72 0	1B 114 00	&%R0
-ENDS UPSIDE DOWN PRINT			

The printer will return to normal mode. Characters in the print buffer that have not been printed will not be printed.

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VALIDATION OPEN (VALIDATION MODELS ONLY)

ASCII    DECIMAL    HEXADECIMAL    PCL  
ESC DC1  27 17            1B 11            &%VO  
-open forms comp

This command opens the forms compensation assembly and turns on the ALM light. A form may now be inserted into the printer for up to 15 lines of validation print. The forms compensation assembly must be closed by the appropriate software command or by pressing the black square button on the front panel (printer deselected) prior to printing on the inserted form.

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VALIDATION CLOSE (VALIDATION MODELS ONLY)

ASCII    DECIMAL    HEXADECIMAL    PCL  
ESC DC3  27 19            1B 13            &%VC  
-close forms comp

This command closes the forms compensation assembly and turns off the ALM light. If the forms compensation assembly is already closed, the command is ignored.

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VALIDATION CLOSE ON SLIP INSERTION (VALIDATION MODELS ONLY)

ASCII    DECIMAL    HEXADECIMAL    PCL  
ESC DC4  27 20            1B 14            &%VS  
-close forms comp on slip insertion

This command is similar to the Validation Close command except the forms compensation assembly does not close until an inserted form is sensed by the printer. The forms sensor is located at the right edge of the paper path at the bottom of the validation slot. If for any reason the form is not detected, this command can be overridden by pressing the black square button on the front panel.

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BUSY UNTIL BUFFER EMPTY & CASH DRAWER CLOSED

ASCII    DECIMAL    HEXADECIMAL    PCL  
EOT        4                04                N/A  
-sets printer busy

This command causes the printer to immediately set the communications interface busy. The printer will remain in the busy state until the communications buffer has been emptied and the cash drawer has been closed (status option required). 2K BUFFER REQUIRED

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SELECT IBM CHARACTER SET

ASCII    DECIMAL    HEXADECIMAL    PCL  
ESC 7    27 55            1B 37            N/A  
-selects IBM character set I  
ESC 6    27 54            1B 36            N/A  
-selects IBM character set II

When the printer is turned on, Character set 1 is automatically selected. Switch 7, which controls character set selection is factory set to the OFF position, establishing Character Set I as the default character set. Character Set II can be established as the default character set by setting switch 7 to the ON position. Character Set II can be selected within a program by implementing the ESC 6 control code.

The major difference between the two character sets is that Character Set II contains characters and symbols that are used in the IBM Graphics Printer. ESC 6 overrides the character set switch (switch 7).

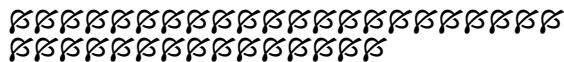
See Appendix D for the IBM character set chart.

INTERLEAVED 2 OF 5 BAR CODE

ASCII	DECIMAL	HEXADECIMAL	PCL
N/A	N/A	B/A	&%25
-PRINTS INTERLEAVED 2 OF 5 BAR CODES			

INTERLEAVED 2 OF 5 BAR CODE (CONT)

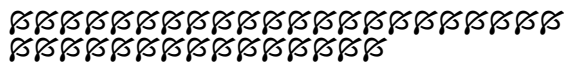
This command is followed by the numeric data to be printed (up to 16 characters). The bar code is printed when a carriage return is detected. If the total number of digits is odd, the printer will add a leading 0 to conform to the 12 of 5 bar code standard. Interleaved 2 of 5 supports numeric digits 0-9 only. Out of range characters will print as 0.



CODE 39

ASCII	DECIMAL	HEXADECIMAL	PCL
N/A	N/A	B/A	&%39
-PRINTS CODE 39 BAR CODES			

This command is followed by the numeric data to be printed (up to 8 characters). The bar code is printed when a carriage return is detected. A checksum character, if required, must be calculated by the host and transmitted as part of the data stream. Start and stop characters are automatically inserted by the printer.



CODE 128

ASCII	DECIMAL	HEXADECIMAL	PCL
N/A	N/A	B/A	&%12
-PRINTS CODE 128 BAR CODES			

This command is followed by the numeric data to be printed (up to 8 characters). The bar code is printed when a carriage return is detected. A checksum is automatically calculated by the printer

along with the stop code. The appropriate start code must be sent from the host.

OPERATE CASH DRAWER 1

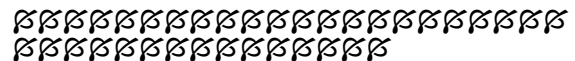
ASCII	DECIMAL	HEXADECIMAL	PCL
BEL	7	07	&%DF
-fire cash drawer 1			

This command opens cash drawer 1.

OPERATE CASH DRAWER 2

ASCII	DECIMAL	HEXADECIMAL	PCL
BS	8	08	&%D2
-fire cash drawer 2			

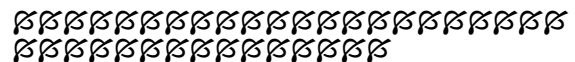
This commands opens cash drawer 2.



CASH DRAWER STATUS-ENABLE/DISABLE

ASCII	DECIMAL	HEXADECIMAL	PCL
ENQ	5	05	N/A
-enable cash drawer status sense switch			

ACK	6	06	N/A
-disable cash drawer status switch sense			



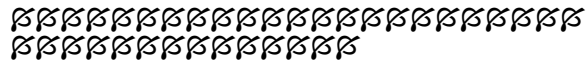
CASH DRAWER STATUS-SERIAL INTERFACE:

A status byte is transmitted to the host upon receipt of the ENQ command from the host.

The status byte is defined as follows:



The cancel code clears the print buffer. This command **DOES NOT** clear the communications buffer.



EMPHASIZED AND ENHANCED PRINTING

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC E	27 69	1B 45	&%MN
-print enhanced			
ESC F	27 70	1B 46	&%CM
-back to normal			
ESC G	27 71	1B 47	&%ME
-print emphasized			
ESC H	27 72	1B 48	&%CE
-back to normal			

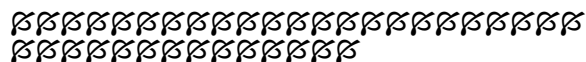
EMPHASIZED AND ENHANCED PRINTING (CONT)

Enhanced printing provides a deeper resolution of each character because each character is printed twice by shifting the dot positions vertically.

Emphasized printing causes each character to be printed by shifting the dots horizontally, thus creating a bolder image. When you select 17.1 CPI emphasized, the characters will be printed at 10 CPI + emphasized, but upon termination the EMP, the printer will return to 17.1 CPI.

Neither feature is available for subscript, superscript characters.

Enhanced and emphasized printing may be done simultaneously for special effects.



APA GRAPHICS

ASCII	DECIMAL	HEXADECIMAL	PCL
ESC K n1..n2	27 75 n1..N2	1B 4B n1..n2	N/A
-single density graphics			
ESC L n1..n2	27 76 n1..n2	1B 4C n1..n2	N/A
-half speed double density graphics			
ESC Y n1..n2	27 89 n1..n2	1B 59 n1..n2	N/A
-full speed double density graphics			
ESC Z n1..n2	27 90 n1..n2	1B 5A n1..n2	N/A
-quadruple density graphics			

Using APA (All Points Addressable) graphics, the printer can draw any kind of illustration. The easiest method is to combine the printer's graphic capabilities with a high quality software package. This emulation will work properly with any graphics software package designed for the IBM Personal Computer and IBM graphics printers. No software modifications are required and images will be printed without distortion.

PROGRAMMING APA (Bit Image) GRAPHICS

You can also write a program that prints a graphic image directly, without transferring it from the display screen. This section explains how to do this using BASIC statements.

Your printer prints graphic images in successive columns of eight dots. The LPRINT statement that tells the printer to do this has three components:

1. The control code sequence that puts the printer into the graphics mode,
2. The number of columns of graphics to be printed, and
3. The coded information that tells the printer which dots to print in each column.

There are four modes of bit image graphics available with your printer. They differ in horizontal resolution, or density (this indicates how close together the dots are), and it's measured by the number of dots per inch (dpi). All modes have a vertical resolution of 72 dpi. For reference, the diameter of a dot is 1/72". The modes are discussed in more detail in the next section on control codes.



maximum number of dot columns per line allowed for the graphics model and printer you are using (see table below).

MAXIMUM GRAPHICS COLUMNS PER LINE	
GRAPHICS MODE	MAX COL. PER LINE
ESC K (SINGLE DENSITY)	144
ESC L/ESC Y (DOUBLE DENSITY)	288
ESC Z (QUADRUPLE DENSITY)	576

If the value entered is greater than the allowed maximum, the proper maximum value will automatically be entered.

### 3. Graphic Information

The last part of the graphics statement contains numerical information that tells the printer to print dots at specific positions in each column. It's easiest to lay out your image on graph paper, filling in the squares where you want a dot to appear. (If you want to use higher density graphics, keep in mind that the columns will overlap, and remember any restrictions that may apply.) Then divide the image into strips of eight rows. Each row will be programmed as a separate LPRINT statement.

Each position in the column has a numerical value as shown in the table below. Simply add up the value of the column positions where you want a dot to appear; the total is then entered in your LPRINT statement.

#### Column Position Values

Column Position	Decimal Values	BIT
-----------------	----------------	-----

TOP

0	128	2 <sup>7</sup>
0	64	2 <sup>6</sup>
0	32	2 <sup>5</sup>
0	16	2 <sup>4</sup>
0	8	2 <sup>3</sup>
0	4	2 <sup>2</sup>
0	2	2 <sup>1</sup>
0	1	2 <sup>0</sup>

BOTTOM

Example:

```

0
0      64
0
0      +16
0      + 8
0      + 4
0
0
0      + 1
Enter   93  as CHR$(93)
    
```

If we call the number for each column Cx. etc., then the complete statement would look like this:

```

LPRINT
CHR$(27);CHR$(75);CHR$(144);CHR$(1);CHR$(c1);
CHR$(c2);...;CHR$(c400)
    
```

## APPENDIX A COMMUNICATIONS

### PARALLEL CABLE SPECIFICATIONS

This information allows an experienced technician make the communication cables necessary to connect the 50PLUS printer to a computer or terminal. Please do not attempt to make this cable, if inexperienced. Also are the communication cable signals from the printer end of the cable. It may be necessary for the printer owner to check the computer or terminal manuals for information regarding the computer end of the cables. Methods of testing the communication functions are also provided.

The 50PLUS printer requires a Centronics equivalent parallel cable with the following:

- \* Amphenol 57-30360 or AMP 552274-1 plug (or equivalent) with 36 pins.
- \* AMP 552073-1 (or equivalent) cover.
- \* Beldon (or equivalent) shielded cable, maximum 15 feet with twisted pair conductors. The cable must be UL and CSA approved.

The wiring requirements are listed in the table on the following page.

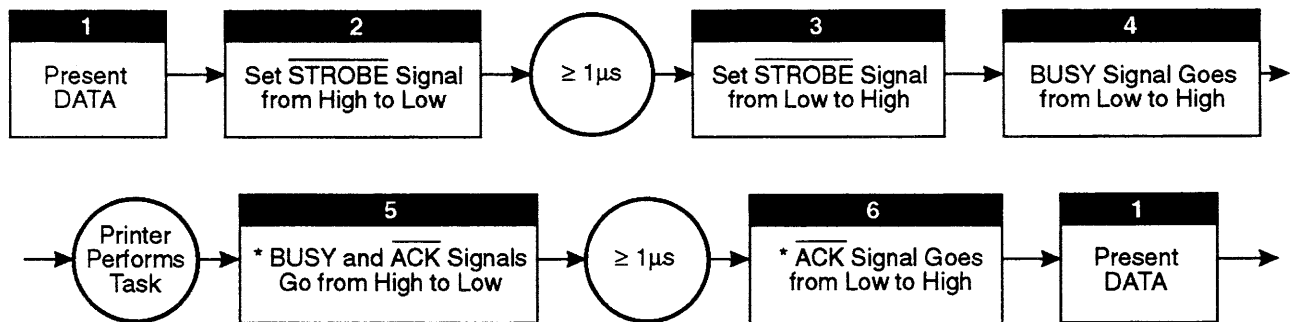


**INTERFACE SIGNALS FOR PARALLEL(CENTRONICS) VERSION PRINTERS**

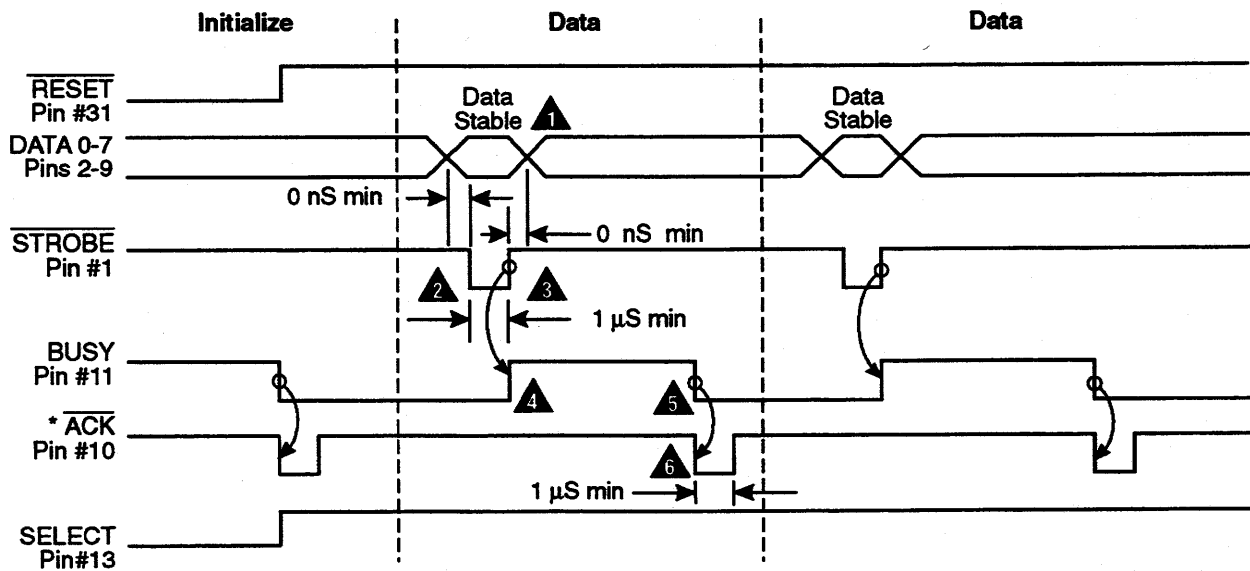
PIN #		Return Pin #	Direction	Description
1	<u>Data Strobe</u>	19	To Printer	STROBE pulse of read data in. Pulse width must be more than 0.5 $\mu$ s at receiving terminal. The signal level is normally high; read-in data is performed at the LOW level of this signal.
2	Data 1	20	To Printer	These signals represent information of the 1st to 8th bits of parallel data respectively. Each signal is at HIGH level when data is logical "1" and LOW when data is logical "0".  Data bit 8 can be grounded for 7 bit systems by setting function switch 1 to ON.
3	Data 2	21	To Printer	
4	Data 3	22	To Printer	
5	Data 4	23	To Printer	
6	Data 5	24	To Printer	
7	Data 6	25	To Printer	
8	Data 7	26	To Printer	
9	Data 8	27	To Printer	
10	<u>Acknowledge</u>	28	From Printer	Aproximately 5 $\mu$ s LOW pulse. LOW indicates that data has been received and that the printer is now ready to accept other data.
11	Busy	29	From Printer	A HIGH signal indicates that the printer cannot receive data. The signal becomes HIGH in the following cases: 1. During data entry; 2. During printing; 3. In OFF LINE state; or 4. During printer error status.
12	Paper End	30	From Printer	A HIGH signal indicates that the printer is out of paper.
13	Select	No Return	From Printer	This signal indicates that the return printer is ready to receive data.
14	Pulled High	No Return		
15	Not Used			
16	0V	No Return	Ground	Logic ground.
17	Chassis Ground	No Return	Ground	Printer's chassis ground. In the printer, the chassis ground and the logic ground are isolated from each other.

18	+5V		From Printer	+5V supply (50mA max.)
19-30	0V		Ground	Twisted pair return signal ground level.
31	$\overline{\text{I-Prime}}$		To Printer	Clear/reset/initialize. Low pulse.
32	$\overline{\text{Fault}}$		From Printer	The level of this signal is LOW when the printer: 1. Is in the paper end state; 2. Is in the OFF LINE state; or 4. Is in the error state.
33	0V	No Return		Logic Ground
34-35	Not Used			
36	Pulled High	No Return		

### Centronics Parallel Communications Sequence



### Centronics Parallel Timing Diagram



## SERIAL CABLE

The 50PLUS Printer requires an RS232-C shielded cable, UL and CSA approved, and no more than 50 feet in length. The following connector should be installed on the end.

- \* Cannon DB-25 plug (or equivalent) 25 pins
- \* Cannon DB-C2-J9 (or equivalent) connector shell.

## SERIAL INTERFACE (RS232C) CABLE REQUIREMENTS

<ul style="list-style-type: none"> <li>• UP TO 19.2K BAUD</li> <li>• 2 K BUFFER</li> <li>• READY/BUSY OR XON/XOFF PROTOCOL</li> <li>• COMMUNICATIONS DIAGNOSTIC MODE</li> </ul>				
PIN	SIGNAL	SYMBOL	DIRECTION	DESCRIPTION
1	Protective Ground	PG	Ground	Connected to the printer frame.
2	Transmit Data	TD	From Printer	Transmits serial data from the printer in XON/XOFF protocol.
3	Receive Data	RD	To Printer	Serial data received by the printer.
4	Request to Send	RTS	From Printer	In printer Ready/Busy protocol indicates printer not ready to receive data.
6	Data Set Ready	DSR	To Printer	Tells the Printer the computer is ready to send data. The printer receives data after confirming this signal as high (1).
7	Signal Ground	SG	Ground	Ground
11	Supervisory Send Data	SSD	From Printer	Indicates the printer is not ready to receive data in Ready/Busy protocol.
13	Signal Ground	SG	Ground	Ground
20	Data Terminal Ready	DTR	From Printer	Indicates the printer is not ready to receive data in Ready/Busy protocol.

### IP SERIAL INTERFACE CABLE CONFIGURATIONS

#### Serial PC to IP

IP part # 253-9800005 - use for PcOS 50/250 Serial Printers connected to PC's or PS/2's with 25 pin serial ports.

HOST (DB-25 FEMALE)

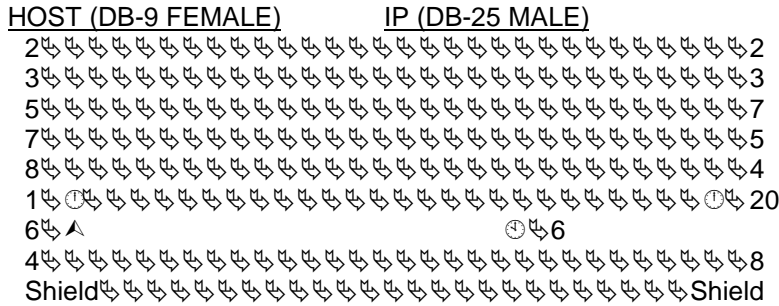
IP (DB-25 MALE)





SERIAL AT to IP

IP part # 253-9800006 - use for PcOS 50/250 Serial Printers connected to PC's or PS2/s with 9-pin serial ports.



SERIAL MAC TO IP

IP part # 253-9800004 - use for PcOS 50/250 Serial Printers connected to a MAC+, MAC SE, or MAC II serial port (MODEM or PRINTER).



**IP STOCK PRINTER CABLES**

PART NUMBER   DESCRIPTION

253-9800002   PARALLEL PC TO IP

This cable is the de-facto standard parallel printer cable. There is a 25-pin female D-shell connector on the PC end and a 36-pin Centronics-type on the printer end. All PC's and most terminals can use this cable to connect Ithaca Peripherals 50PLUS centronics compatible printer to the centronics parallel port.

253-9800004   SERIAL MAC TO IP

Use this cable to connect the Ithaca Peripherals 50PLUS Serial Printers to Apple MAC+, MAC SE, or MAC II serial ports (MODEM or PRINTER). This cable has a 8-pin male mini-DIN on the MAC end and a 25-pin male on the printer end.

## 253-9800005 SERIAL PC TO IP

Use this cable to connect the Ithaca Peripherals 50PLUS Serial Printers to PC's or PS/2's with 25-pin serial ports. This cable has a 25-pin female connector on the host end and a 25-pin male connector on the printer end.

## 253-9800006 SERIAL AT TO IP

Use this cable to connect the Ithaca Peripherals 50PLUS Serial Printers to PC's or PS/2's with 9-pin serial ports. This cable has a 9-pin female connector on the host end and a 25-pin male connector on the printer end.

## 253-9800007 SERIAL TERMINAL TO IP

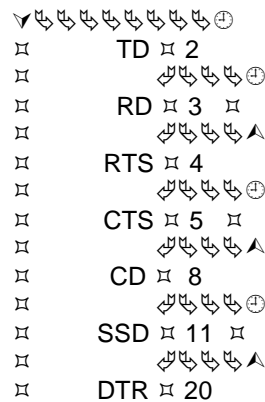
Use this cable to connect the Ithaca Peripherals 50PLUS serial printers to most general purpose terminals that have a RS232C serial port. This cable is a 25-pin male to male with a one-to-one pin-out. If its a Unix/Xenix-based system, almost invariably the terminals are general-purpose and this cable will work with the printer running off the terminal printer port (also called the AUX port).

## APPENDIX B - TROUBLE SHOOTING

### SERIAL DIAGNOSTIC TESTS

#### Serial Board

This test is used to check the serial cable to ensure that it is sending and receiving the correct signals. Either of the following tests may be run. When performing the circuit test, it may be necessary to purchase (or make) a test cable as shown below. Then follow the directions in the Serial Interface test paragraph.





Test Cable

1. Insert paper and ribbon into the printer, then turn the printer off.
2. Remove the switch access cover from the bottom of the printer.

cable). If the problem cannot be resolved, contact the dealer for assistance.

6. Reset switch #6 (SW1) to the ON position. (It does not matter what position switch #5 (SW1) is in.
7. Replace the switch access cover or perform the monitor mode test.

## Serial Interface

A circuit test checks the serial interface to ensure that the proper signals are sent across the active lines. This test provides a printout notice indicating whether or not the test was completed successfully. To initiate the test do the following: (Flowchart on page 99)

1. Set switch #6 (SW1) OFF to select the diagnostic mode.
2. Set switch #5 (SW1) ON to select the circuit test.
3. Disconnect the present interface cable and connect the test cable.
4. Turn the printer on. This should produce the following results: 1.0 or the current revision level is printed. Loop Test is also printed.

The message buffer is checked. If the memory is normal, "OK" is printed. If memory is faulty, "BAD" is printed.

The signals DTR, RTS, and SSD are set low (-). If CTS, DSR, or CD are positive, "I/F BAD" is printed, otherwise "I/F OK" is printed.

5. If the "BAD" message is received, something is wrong with the serial interface (or test

**SERIAL DIAGNOSTIC TESTS - CONTINUED.****Monitor Mode**

The monitor mode test is a unique feature of the High Speed interface board. This test can be used to verify that the data sent to the printer is set for the proper baud rate, parity, and number of data bits. To perform this test do the following: (Flowchart on page 100)

1. Set switches 5 and 6 OFF (SW1) to select the monitor mode test.
2. Turn the printer and computer ON.
3. Enter the characters "ABCDEFGHILJK" followed by a carriage return. (Use the programming statement that the computer requires, like LPRINT or PR#1). In BASIC, the statement would look like this:

**10 LPRINT "ABCDEFGHILJK"**

4. The printer should respond by printing the hexadecimal (base 16) equivalent of each character. See the response below:

**41 42 43 44 45 46 47 48 49 4A 4B 4C 0D 0A**

**NOTE:** The hexadecimal numbers 41 thru 4c are the characters "A" through "L". 0D is the hexadecimal symbol for a carriage return. 0A is the HEX symbol for a line feed.

5. If the above printout appeared the first time, the cable is correctly configured for the series 50 printer. At this time reset switches 5 and 6 (SW1), then replace the switch cover.
6. If the printout was incorrect or nothing printed, see the following paragraphs for a listing of printouts and causes.

**Nothing Printed:**

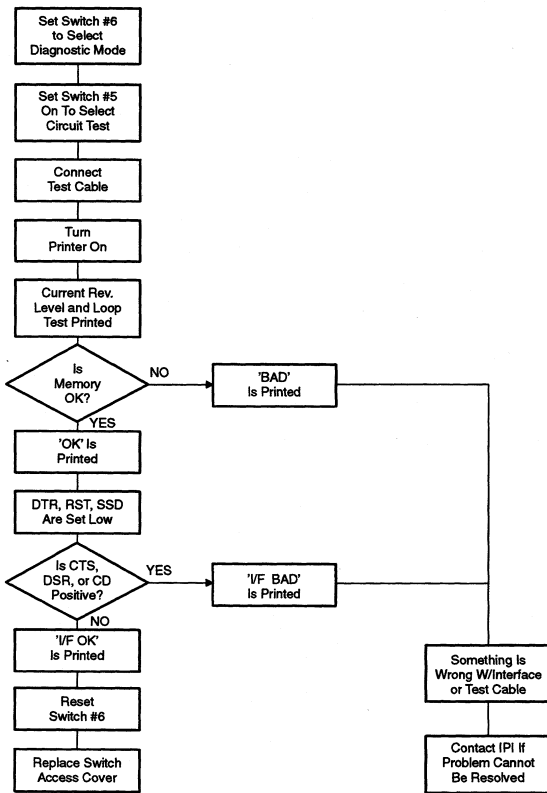
- \* Was the right print statement used for the computer?
- \* Check to see if the interface cable is connected properly.
- \* Check to see if the cable is wired to the specifications given earlier in this publication.
- \* Check to make sure that the printer is plugged in, turned ON, and the SEL light is ON.

**"Parity Error" Printed**

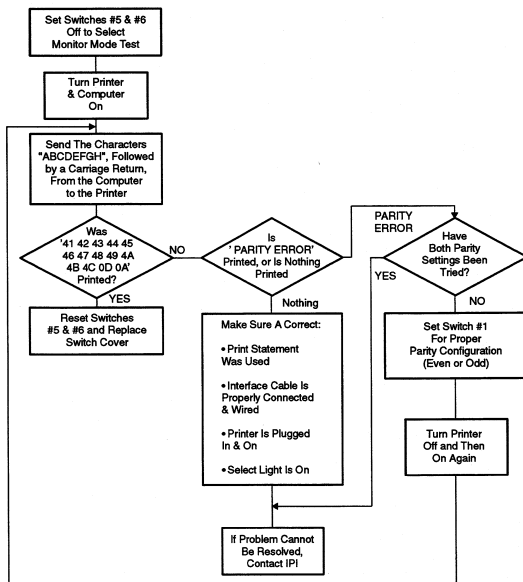
A parity error occurs when the printer checks for an odd number of binary digits and an even number is received, or vice versa. If switch #1 and #2 (SW1) are set ODD PARITY, try setting them for EVEN PARITY. Then turn the printer off and on and try the test again. Return to normal operation by setting switch #6 (SW1) ON and switch #5 (SW1) OFF, then power cycle.



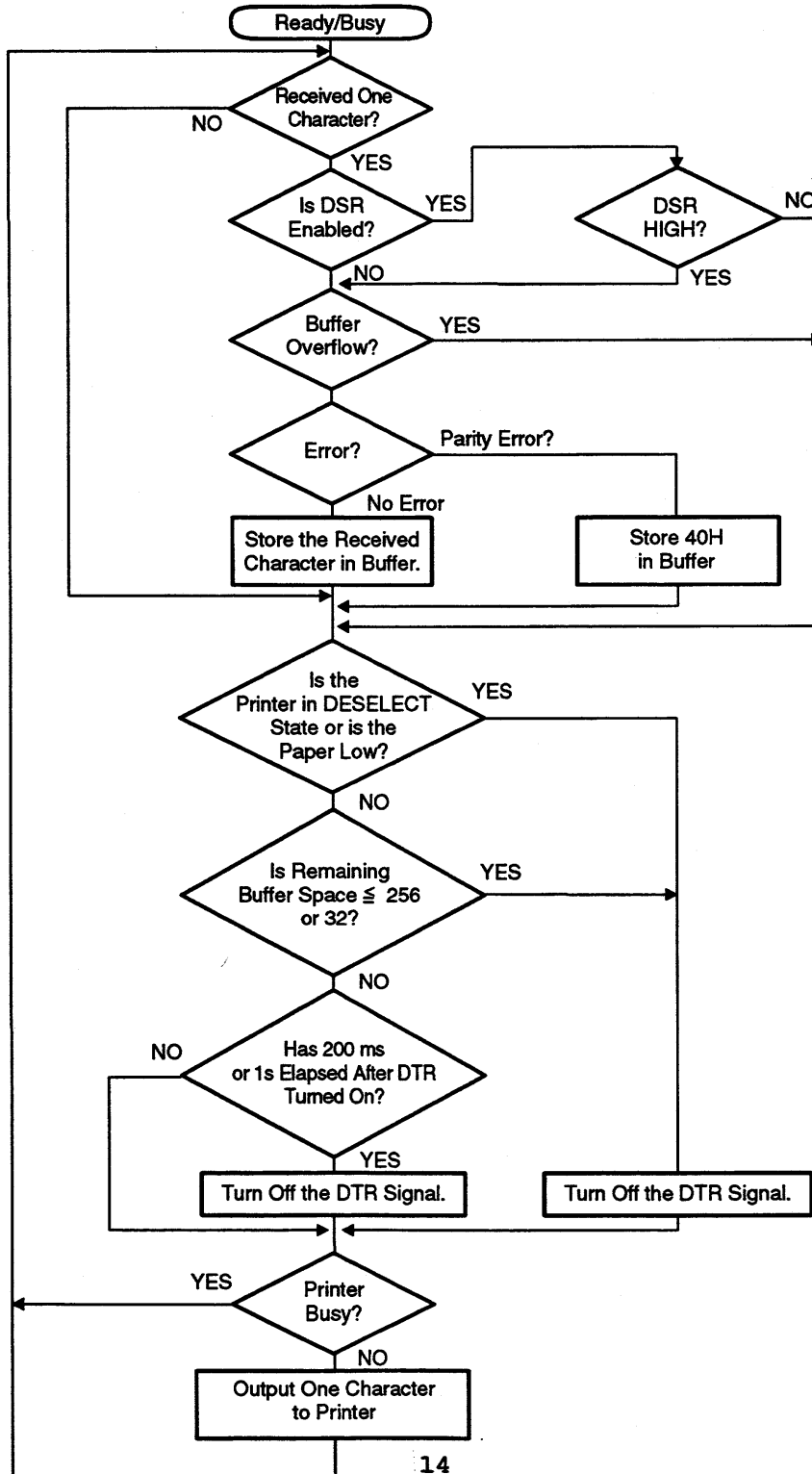
### Performing the Circuit Test



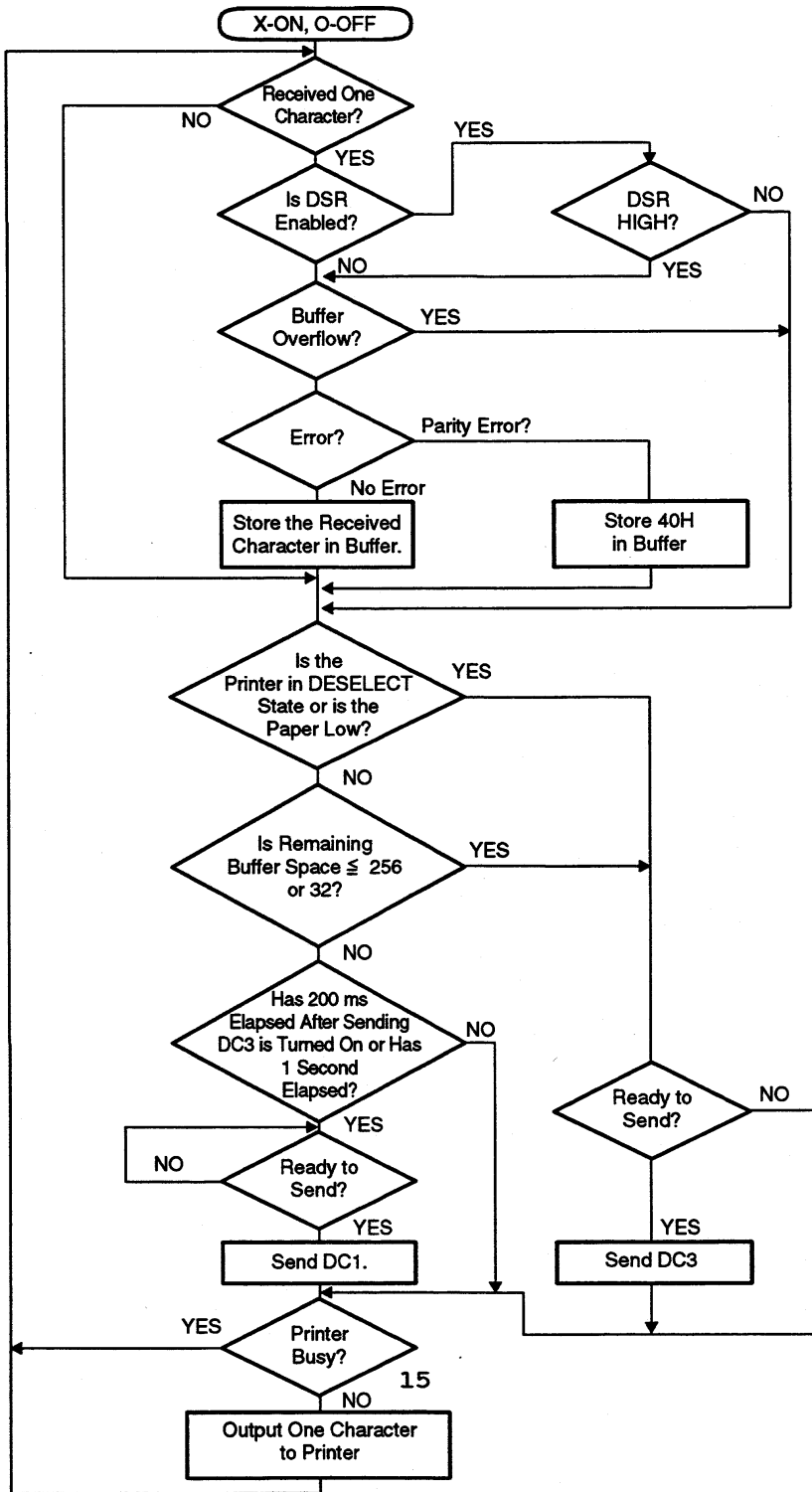
### Performing the Monitor Mode Test



### Ready/Busy Flowchart



### X-ON/X-OFF Flowchart



## TROUBLE SHOOTING

Although the 50PLUS printers are designed for reliable, trouble-free operation, problems may occasionally occur which are usually easy to correct. The lists below may offer some easy solutions to the problems. If a problem is still unresolved, then it may be necessary to contact the dealer for assistance.

### PRINTER HAS NO RESPONSE (NO LIGHTS, NO NOISE)

- \* Make sure that the printer ac power cord is plugged in securely on both ends.
- \* Check to see if the ac receptacle has power by plugging in another ac powered device such as a lamp.
- \* Check the printer power switch and turn it OFF and then ON again.

### ALM LIGHT ON STEADY

1. Check paper roll for proper installation. Paper may be out or on top of the paper out switch.
2. Check the printer power switch and turn it OFF and then ON again.

### ALM LIGHT FLASHING AND PRINT HEAD DOES NOT MOVE

1. Remove the carriage shipping restraint.
2. Check behind print head for a paper jam.
3. The print head should move back and forth to each limit very easily. Look for foreign objects. Check the wiring cable and make sure that it did not come loose and become wedged against the side of the print head.
4. Check the printer power switch and turn it OFF and ON again.
5. Check the ink ribbon and make sure that it isn't twisted or jammed. The ribbon should advance freely when turning the ribbon take up knob on the ribbon cassette.

### NO COMMUNICATION TO MAIN PRINTER

1. Check all cable connections for tightness.
2. Check all configuration switch settings.
3. Substitute a working printer to verify that the wiring and the main computer is functioning properly.

### PRINTS ONLY THE FIRST TWO LINES OF THE DIAGNOSTIC TEST

1. Check the printhead ribbon cable by moving the printhead to the extreme right side. If the ribbon cable looks out of position, pick the cable up off the bottom and reposition it. The sticky material under the cable should allow it to be repositioned.

### PRINT SMEARED

1. Adjust the printhead gap.
2. Check for a paper jam at the printhead.
3. Check the ink ribbon to see if it is twisted or jammed. The ribbon should advance freely when turning the ribbon take up knob on the ribbon cassette.
4. Check the plastic guide on the front of the ribbon cassette. Make sure that it isn't dislodged or bent. If in doubt, compare it to a new cassette.
5. Replace the ink ribbon cassette.

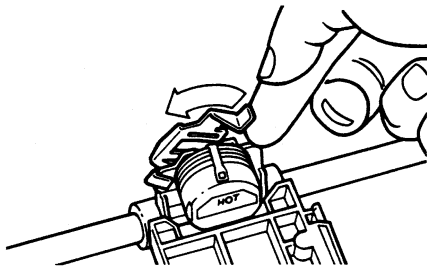
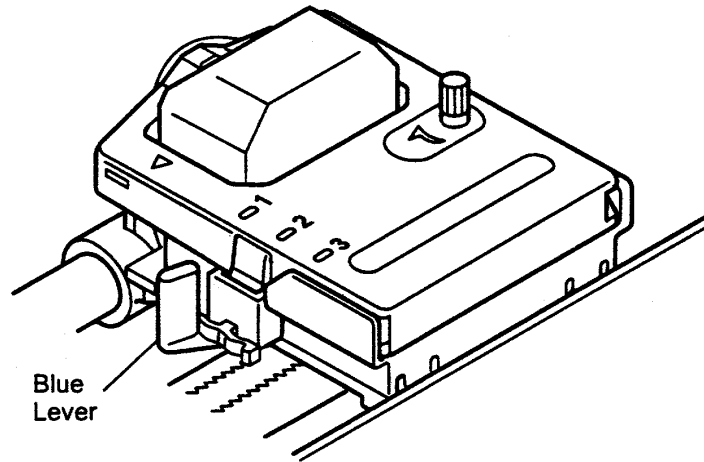
### PAPER JAMS OR TEARS

1. Adjust the printhead gap.
2. Is the correct kind of paper being used?
3. Remove printhead and reinstall.

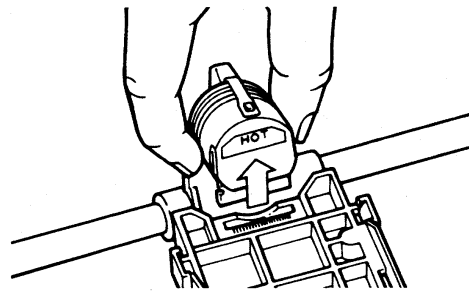
### PRINTHEAD GAP ADJUSTMENT

The gap between the printhead and the platen is adjustable to accommodate different paper thicknesses. The blue lever, located to the left of the ribbon cassette, moves the printhead through three positions. The position nearest the platen, position 1, is for 1 or 2 part paper.

Should the printhead jam or smudging occur, increase the gap by moving the lever to position 2 or 3. For best print density, set printhead for the minimum gap where smudging or jamming does not occur.



**INSTALL AND REMOVE PRINTHEAD**



## 50PLUS Series Printer Self Test

The 50PLUS Series Printers have been equipped with three enhanced diagnostic test routines which are entered by holding one or more buttons down on the control panel while turning on the power switch. The routines and the switches used to enter them are as follows:

**NOTE:** While the test is printing, the **SEL** light should remain off.

### A. ROLLING CHARACTER PATTERN

1. Turn the printer off.
2. Press the **SEL** and **LF** buttons on the front panel and hold down and turn on the power switch.
3. The test pattern should print beginning with a firmware part number and revision, then followed by a rolling character pattern.
4. To terminate the self test, press the **SEL** button on the front panel twice, or turn the printer off.

### B. FULL FUNCTION DIAGNOSTIC

Full function diagnostic including auto cutter test (if option present) on Models PcOS 51 and PcOS 52 and 15 line validation test on Model PcOS 53.

1. Turn the printer off.
2. Press **LF** button and turn the printer on.
3. The test pattern should print beginning with a firmware part number and revision. The printer will then print out every font the printer is equipped with and test either the auto cutter or the validation functions (if present).
4. To terminate the diagnostic mode, press the **SEL** button once or turn the printer off.

### C. HEX DATA DUMP MODE

1. Enter the Hex Data Dump mode by holding the **SEL** and the **CENTER BUTTON** down while turning on the power switch.
2. Then do a normal receipt. The hexadecimal equivalent of all of the control codes and characters that are sent to the printer will print on the receipt. Using this printout, an ASCII chart, and the quick reference chart for the printer emulation that the printer is equipped with, you can see if the correct printer control codes are being sent to the printer by your system.
3. To terminate the Hex Data Dump, press the **SEL** button on the front panel once or turn the printer off.

### ROLLING CHARACTER TEST PRINTOUT

```

PcOS 50 PLUS
PE-0100.16

!"#$%&'()*+,-./0123456789:;<=?@ABCDEFGHI
HIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./012345678
9:;<=?@ABCD
!"#$%&'()*+,-./0123456789:;<=?@ABCDEFGHI
IJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789
:;<=?@ABCDE
!"#$%&'()*+,-./0123456789:;<=?@ABCDEFGHI
JKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
rstuvwxyz{|}~!"#$%&'()*+,-./0123456789:
;<=?@ABCDEF
!"#$%&'()*+,-./0123456789:;<=?@ABCDEFGH
IJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
rstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<
=?@ABCDEF
!"#$%&'()*+,-./0123456789:;<=?@ABCDEFGHIJK
LMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
tuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<
=?@ABCDEF
!"#$%&'()*+,-./0123456789:;<=?@ABCDEFGHIJKL
MNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
tuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=
)?@ABCDEFGHI
!"#$%&'()*+,-./0123456789:;<=?@ABCDEFGHIJKL
MNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
tuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=
)?@ABCDEFGHI
!"#$%&'()*+,-./0123456789:;<=?@ABCDEFGHIJKL
MNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
tuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=?
@ABCDEFGHIJK

```

### FULL FUNCTION DIAGNOSTIC PRINTOUT

**PcOS 50 PLUS  
PE-0100.16**

```
UTL 10 CPI
!"#$%&'()*+,-./01234567
89:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`abcdefg
hijklmnopqrstuvwxyz{|}~`
```

```
UTL 12 CPI
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
OPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
tuvwxyz{|}~`
```

```
UTL 17 CPI
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
GHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
qrstuvwxyz{|}~`
```

```
HSD 10 CPI
!"#$%&'()*+,-./01234567
89:;<=>?@ABCDEFGHIJKLMNO
PQRSTUVWXYZ[\]^_`abcdefg
hijklmnopqrstuvwxyz{|}~`
```

```
HSD 12 CPI
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
GHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
tuvwxyz{|}~`
```

```
HSD 17 CPI
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
GHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
qrstuvwxyz{|}~`
```

```
UTL 10 CPI
Double Width
!"#$%&'()*+,-./01234567
89:;<=>?@ABCDEF
GHIJKLMNOP
QRSTUVWXYZ[\]^_`
abcdefghijklmnopqr
stuvwxyz{|}~`
```

Validation Test- Line 1

```
Line 2
Line 3
Line 4
Line 5
Line 6
Line 7
Line 8
Line 9
Line 10
Line 11
Line 12
Line 13
Line 14
Line 15
```

Test Complete

HEX DATA DUMP PRINTOUT

```

Hex Data Dump
1B 79 01 1B 23 30 1B 3A      .y..#0.:
1B 37 1B 30 1B 41 09 1B      .7.0.A..
70 00 1B 75 00 1B 66 12      p..u..f.
1B 49 01 1B 45 1B 47 1B      .I..E.G.
30 20 20 49 54 46 41 43      0 ITHAC
41 20 50 45 52 49 50 48      A PERIPH
45 52 41 4C 53 20 49 4E      ERALS IN
43 2E 0B 0A 0D 0A 1B 57      C.....W
01 20 20 20 49 50 49 2D      . IPI-
4D 41 52 54 0D 0A 1B 46      MART...F
0F 20 0D 0A 1B 76 20 20      . ...V
20 57 45 20 53 45 4C 4C      ME SELL
20 46 4F 52 20 4C 45 53      FOR LES
53 21 21 0B 0A 1B 57 00      S!!--U.
1B 23 30 0D 0A 1B 48 1B      .#0...H.
46 20 20 20 20 20 20 20      F
20 20 20 20 20 20 20 20
20 20 20 20 20 20 32 30 30      200
30 0D 0A 20 20 20 20 20      0..
20 20 20 20 20 20 20 20
20 20 49 74 68 61 63 61      Ithaca
2C 20 4E 65 77 20 59 6F      , New Yo
72 6B 0D 0A 28 36 30 37      rk., (607
29 32 35 37 2D 38 39 30      )257-890
31 0B 0A 53 54 23 20 32      1..ST# 2
30 30 30 20 20 20 20 20      000
4F 50 23 20 30 30 30 36      OP# 0006
37 20 20 20 20 20 54 45      7 TE
23 20 30 32 31 20 20 20      # 021
20 20 20 54 52 23 30 30      TR#00
30 33 35 0B 0A 4B 4C 45      035..KLE
45 4E 45 58 20 46 41 4D      ENEX FAN

20 20 20 20 20 20 20 20
20 20 44 30 34 20 51 54      D04 QT
59 20 31 20 20 20 20 20      Y 1
20 20 20 20 20 20 20 31      1
2E 36 38 20 4A 0D 0A 52      .68 J..R
49 54 5A 20 20 20 20 20      ITZ
20 20 20 20 20 20 20 20
20 20 20 20 44 30 31 20      D01
51 54 59 20 31 20 20 20      QTY 1
20 20 20 20 20 20 20 20
20 32 2E 35 30 20 44 0D      2.50 D.
0A 43 48 49 50 53 20 20      .CHIPS
20 20 20 20 20 20 20 20
20 20 20 20 20 20 44 30      D0
31 20 51 54 59 20 31 20      1 QTY 1
20 20 20 20 20 20 20 20
20 20 20 31 2E 35 30 20      1.50
44 0D 0A 53 54 4F 52 41      D..STORA
47 45 20 42 41 47 20 20      GE BAG
20 20 20 20 20 20 20 20
44 30 34 20 51 54 59 20      D04 QTY
31 20 20 20 20 20 20 20      1
20 20 20 20 20 31 2E 35      1.5
30 20 4A 0D 0A 20 20 20      0 J..
20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20
20 53 55 42 20 54 4F 54      SUB TOT
41 4C 20 20 20 20 20 37      AL 7
2E 31 38 0D 0A 20 20 20      .18..
20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20

```



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**APPENDIX C**

## ASCII CHART

HEX	Decimal	ASCII	Hex	Decimal	ASCII	Hex	Decimal	ASCII	HEX	Decimal	ASCII
00	0	NULL	20	32	(SP)	40	64	@	60	96	`
01	1	SOH	21	33	!	41	65	A	61	97	a
02	2	STX	22	34	"	42	66	B	62	98	b
03	3	ETX	23	35	#	43	67	C	63	99	c
04	4	EOT	24	36	\$	44	68	D	64	100	d
05	5	ENQ	25	37	%	45	69	E	65	101	e
06	6	ACK	26	38	&	46	70	F	66	102	f
07	7	BEL	27	39	'	47	71	G	67	103	g
08	8	BS	28	40	(	48	72	H	68	104	h
09	9	HT	29	41	)	49	73	I	69	105	i
0A	10	LF	2A	42	*	4A	74	J	6A	106	j
0B	11	VT	2B	43	+	4B	75	K	6B	107	k
0C	12	FF	2C	44	,	4C	76	L	6C	108	l
0D	13	CR	2D	45	-	4D	77	M	6D	109	m
0E	14	SO	2E	46	.	4E	78	N	6E	110	n
0F	15	SI	2F	47	/	4F	79	O	6F	111	o
10	16	DEL	30	48	0	50	80	P	70	112	p
11	17	DC1	31	49	1	51	81	Q	71	113	q
12	18	DC2	32	50	2	52	82	R	72	114	r
13	19	DC3	33	51	3	53	83	S	73	115	s
14	20	DC4	34	52	4	54	84	T	74	116	t
15	21	NAK	35	53	5	55	85	U	75	117	u
16	22	SYN	36	54	6	56	86	V	76	118	v
17	23	ETB	37	55	7	57	87	W	77	119	w
18	24	CAN	38	56	8	58	88	X	78	120	x
19	25	EM	39	57	9	59	89	Y	79	121	y
1A	26	SUB	3A	58	:	5A	90	Z	7A	122	z
1B	27	ESC	3B	59	;	5B	91	[	7B	123	{
1C	28	FS	3C	60	<	5C	92	\	7C	124	
1D	29	GS	3D	61	=	5D	93	]	7D	125	}
1E	30	RS	3E	62	>	5E	94	^	7E	126	~
1F	31	US	3F	63	?	5F	95	_	7F	127	(sp)

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**APPENDIX D  
IBM CHARACTER SET I**

Hex.	Dec.	Character
00	0	NUL
01	1	SOH
02	2	STX
03	3	ETX
04	4	EOT
05	5	ENQ
06	6	ACK
07	7	BEL
08	8	BS
09	9	HT
0A	10	LF
0B	11	VT
0C	12	FF
0D	13	CR
0E	14	SO
0F	15	SI
10	16	DLE
11	17	DC1
12	18	DC2
13	19	DC3
14	20	DC4
15	21	NAK
16	22	SYN
17	23	ETB
18	24	CAN
19	25	EM
1A	26	SUB
1B	27	ESC
1C	28	FS
1D	29	GS
1E	30	RS

Hex.	Dec.	Character
1F	31	US
20	32	(SPACE)
21	33	!
22	34	"
23	35	#
24	36	\$
25	37	%
26	38	&
27	39	.
28	40	(
29	41	)
2A	42	*
2B	43	+
2C	44	,
2D	45	-
2E	46	.
2F	47	/
30	48	0
31	49	1
32	50	2
33	51	3
34	52	4
35	53	5
36	54	6
37	55	7
38	56	8
39	57	9
3A	58	:
3B	59	:
3C	60	<
3D	61	=

IBM CHARACTER SET I (CONTINUED)

Hex.	Dec.	Character
3E	62	>
3F	63	?
40	64	@
41	65	A
42	66	B
43	67	C
44	68	D
45	69	E
46	70	F
47	71	G
48	72	H
49	73	I
4A	74	J
4B	75	K
4C	76	L
4D	77	M
4E	78	N
4F	79	O
50	80	P
51	81	Q
52	82	R
53	83	S
54	84	T
55	85	U
56	86	V
57	87	W
58	88	X
59	89	Y
5A	90	Z
5B	91	[
5C	92	\
5D	93	]
5E	94	^

Hex.	Dec.	Character
5F	95	_
60	96	
61	97	a
62	98	b
63	99	c
64	100	d
65	101	e
66	102	f
67	103	g
68	104	h
69	105	i
6A	106	j
6B	107	k
6C	108	l
6D	109	m
6E	110	n
6F	111	o
70	112	p
71	113	q
72	114	r
73	115	s
74	116	t
75	117	u
76	118	v
77	119	w
78	120	x
79	121	y
7A	122	z
7B	123	{
7C	124	
7D	125	}
7E	126	~
7F	127	

## IBM CHARACTER SET I (CONTINUED)

Hex.	Dec.	Character
80	128	
81	129	
82	130	
83	131	
84	132	
85	133	
86	134	
87	135	
88	136	BS
89	137	HT
8A	138	LF
8B	139	VT
8C	140	FF
8D	141	CR
8E	142	SO
8F	143	SI
90	144	
91	145	DC1
92	146	DC2
93	147	DC3
94	148	DC4
95	149	
96	150	
97	151	
98	152	CAN
99	153	
9A	154	
9B	155	ESC
9C	156	
9D	157	
9E	158	
9F	159	
A0	160	
A1	161	

Hex.	Dec.	Character
A2	162	ó
A3	163	ú
A4	164	ñ
A5	165	Ñ
A6	166	º
A7	167	º
A8	168	¿
A9	169	¿
AA	170	¿
AB	171	¿
AC	172	¿
AD	173	¿
AE	174	¿
AF	175	¿
B0	176	¿
B1	177	¿
B2	178	¿
B3	179	¿
B4	180	¿
B5	181	¿
B6	182	¿
B7	183	¿
B8	184	¿
B9	185	¿
BA	186	¿
BB	187	¿
BC	188	¿
BD	189	¿
BE	190	¿
BF	191	¿
C0	192	¿
C1	193	¿
C2	194	¿
C3	195	¿

## IBM CHARACTER SET I (CONTINUED)

Hex.	Dec.	Character
C4	196	—
C5	197	+
C6	198	+
C7	199	+
C8	200	+
C9	201	+
CA	202	+
CB	203	+
CC	204	+
CD	205	+
CE	206	+
CF	207	+
D0	208	+
D1	209	+
D2	210	+
D3	211	+
D4	212	+
D5	213	+
D6	214	+
D7	215	+
D8	216	+
D9	217	+
DA	218	+
DB	219	+
DC	220	+
DD	221	+
DE	222	+
DF	223	+
E0	224	α
E1	225	β

Hex.	Dec.	Character
E2	226	Γ
E3	227	Π
E4	228	Σ
E5	229	σ
E6	230	μ
E7	231	τ
E8	232	φ
E9	233	θ
EA	234	Ω
EB	235	δ
EC	236	ϑ
ED	237	φ
EE	238	ε
EF	239	π
F0	240	≡
F1	241	+
F2	242	z
F3	243	κ
F4	244	┘
F5	245	┘
F6	246	+
F7	247	≡
F8	248	o
F9	249	o
FA	250	.
FB	251	√
FC	252	η
FD	253	:
FE	254	■
FF	255	(SPACE)

IBM CHARACTER SET II

Hex.	Dec.	Character
00	0	NUL
01	1	SOH
02	2	STX
07	7	BEL
08	8	BS
09	9	HT
0A	10	LF
0B	11	VT
0C	12	FF
0D	13	CR
0E	14	SO
0F	15	SI
10	16	DLE
11	17	DC1
12	18	DC2
13	19	DC3
14	20	DC4
15	21	\$
16	22	SYN
17	23	ETB
18	24	CAN
19	25	EM
1A	26	SUB
1B	27	ESC
1C	28	FS
1D	29	GS
1E	30	RS

Hex.	Dec.	Character
1F	31	US
20	32	(SPACE)
21	33	!
22	34	"
23	35	*
24	36	\$
25	37	%
26	38	&
27	39	.
28	40	(
29	41	)
2A	42	•
2B	43	+
2C	44	.
2D	45	—
2E	46	.
2F	47	/
30	48	0
31	49	1
32	50	2
33	51	3
34	52	4
35	53	5
36	54	6
37	55	7
38	56	8
39	57	9
3A	58	:
3B	59	:
3C	60	<
3D	61	=

IBM CHARACTER SET II (CONTINUED)



Hex.	Dec.	Character
3E	62	>
3F	63	?
40	64	@
41	65	A
42	66	B
43	67	C
44	68	D
45	69	E
46	70	F
47	71	G
48	72	H
49	73	I
4A	74	J
4B	75	K
4C	76	L
4D	77	M
4E	78	N
4F	79	O
50	80	P
51	81	Q
52	82	R
53	83	S
54	84	T
55	85	U
56	86	V
57	87	W
58	88	X
59	89	Y
5A	90	Z
5B	91	[
5C	92	\
5D	93	]
5E	94	^

Hex.	Dec.	Character
5F	95	_
60	96	
61	97	a
62	98	b
63	99	c
64	100	d
65	101	e
66	102	f
67	103	g
68	104	h
69	105	i
6A	106	j
6B	107	k
6C	108	l
6D	109	m
6E	110	n
6F	111	o
70	112	p
71	113	q
72	114	r
73	115	s
74	116	t
75	117	u
76	118	v
77	119	w
78	120	x
79	121	y
7A	122	z
7B	123	{
7C	124	
7D	125	}
7E	126	~
7F	127	

IBM CHARACTER SET II (CONTINUED)

Hex.	Dec.	Character
80	128	Ç
81	129	Ü
82	130	é
83	131	à
84	132	ä
85	133	â
86	134	à
87	135	ç
88	136	è
89	137	ë
8A	138	è
8B	139	ï
8C	140	l
8D	141	l
8E	142	À
8F	143	Á
90	144	É
91	145	æ
92	146	Æ
93	147	ó
94	148	ö
95	149	ò
96	150	ó
97	151	ù
98	152	ÿ
99	153	Ö
9A	154	Ü
9B	155	ç
9C	156	é
9D	157	ÿ
9E	158	À
9F	159	á
A0	160	á
A1	161	í

Hex.	Dec.	Character
A2	162	ó
A3	163	ù
A4	164	ñ
A5	165	Ñ
A6	166	æ
A7	167	æ
A8	168	ç
A9	169	ç
AA	170	è
AB	171	è
AC	172	ï
AD	173	ï
AE	174	l
AF	175	l
B0	176	À
B1	177	À
B2	178	Á
B3	179	Á
B4	180	É
B5	181	É
B6	182	æ
B7	183	æ
B8	184	Æ
B9	185	Æ
BA	186	ó
BB	187	ó
BC	188	ö
BD	189	ö
BE	190	ò
BF	191	ò
C0	192	ó
C1	193	ó
C2	194	ù
C3	195	ù

IBM CHARACTER SET II (CONTINUED)

Hex.	Dec.	Character
C4	196	—
C5	197	+
C6	198	†
C7	199	‡
C8	200	£
C9	201	ƒ
CA	202	†
CB	203	‡
CC	204	—
CD	205	†
CE	206	‡
CF	207	£
D0	208	ƒ
D1	209	†
D2	210	‡
D3	211	£
D4	212	ƒ
D5	213	†
D6	214	‡
D7	215	£
D8	216	ƒ
D9	217	†
DA	218	‡
DB	219	■
DC	220	■
DD	221	■
DE	222	■
DF	223	■
E0	224	α
E1	225	β

Hex.	Dec.	Character
E2	226	Γ
E3	227	Π
E4	228	Σ
E5	229	σ
E6	230	μ
E7	231	τ
E8	232	φ
E9	233	θ
EA	234	Ω
EB	235	δ
EC	236	ϑ
ED	237	φ
EE	238	ε
EF	239	π
F0	240	≡
F1	241	±
F2	242	≈
F3	243	κ
F4	244	∫
F5	245	∫
F6	246	÷
F7	247	≡
F8	248	◊
F9	249	◊
FA	250	◊
FB	251	√
FC	252	η
FD	253	∴
FE	254	■
FF	255	(SPACE)

## APPENDIX E

## PRINTER FEATURES/SPECIFICATIONS

### MODEL DESCRIPTIONS

The Ithaca 50PLUS Printers are stand-alone, 40 column, high speed impact printers for receipt, receipt/journal and receipt/journal/validation applications. The printers are self-contained; no external power supplies or paper rolls are required. The 50PLUS printers are available for the following applications:

- A receipt only printer used for applications requiring high speed receipt printing along with single line validation.
- A receipt/journal printer used for applications requiring a transaction audit trail (journal) in addition to high-speed receipt printing and single line validation.
- A receipt/journal/validation printer that provides receipt and journal functions, and can also print on an inserted form, up to 15 lines for check validation or charge form printing.
- A receipt/validation printer that provides receipt and print, on an inserted form, up to 15 lines for check validation or charge form printing.

### 50PLUS FEATURES

The following features are standard on all Ithaca 50PLUS printers.

- \* Power on/off switch
- \* Power on indicator
- \* Alarm indicator
- \* Printer selected indicator
- \* Power connector
- \* Paper advance switch
- \* Paper out sense switch
- \* Printer select switch
- \* Form insertion switch (Validation model only)
- \* Centronics par. computer interface connector.
- \* RJ11 Cash drawer connector
- \* Short line seeking logic
- \* 9-pin stored energy printhead
- \* IBM Character sets I & II
- \* Lower case characters with descenders
- \* Journal take-up (Journal Models only)
- \* 15 line inserted form validation (Multi-line Validation Model only)
- \* One line val. (Single Line Validation Models only)
- \* 8 lines per inch vertical spacing
- \* Operator controlled self test
- \* Snap-on ribbon
- \* All points addressable graphics
- \* 40 columns at 17 cpi
- \* Cash drawer driver. Provides a 24 volt, 1.5 amp pulse for approximately 150 ms.
- \* Receipt tear-off bar with print zone legend.
- \* Four standard languages (co-resident)
- \* Domestic AC power (US)
- \* Bar Codes (3 symbologies) resident in firmware

## PRINTER FEATURES (CONTINUED)

### OPTIONAL FEATURES

The optional features that follow are designed to replace a standard feature or to be added to the printer to enhance its operation. **ALL OPTIONAL FEATURES ARE FACTORY INSTALLED AND MUST BE SELECTED WHEN PRINTER(S) IS ORDERED.**

- \* RS-232C Serial Communications interface with cash drawer status.
- \* RS-422 communications - up to 19200 Baud.
- \* Journal cover key lock
- \* Rear cover hinges
- \* Special colors and custom logo
- \* International AC power
- \* Automatic Receipt Cut-Off - Ithaca receipt and receipt/journal printers can be ordered with the Automatic Receipt Cut-Off feature. Automatic cut-off provides a full cut or partial cut of the receipt tape at the conclusion of each transaction. Full or Partial cut must be specified at time of order.

## PRINTER SPECIFICATIONS

### Performance

Printhead Speed - 250 characters per second

Lines per second

10 characters/line            7.5 lines/second

20 characters/line           6.4 lines/second

30 characters/line           5.0 lines/second

40 characters/line           4.0 lines/second

Typical receipt speed - 5 to 6 lines per second

Paper Feed                    100mm (3.9  
   inches)/second

### Printing Characteristics

Character matrix - 9 x 9 utility printing

Characters per line - 40 @ 17.1 cpi

- 24 @ 10 cpi

- 28 @ 12 cpi

### Graphics

All points addressable (HxV) IBM Compatible

60 x 72 dots per inch (dpi)

120 x 72 dpi double density

240 x 72 dpi quadruple density

### Media

Receipt and Journal Paper

Number of plies - 1, 2 or 3

Size - 3 1/4 in. x 3 1/2 in. (dia.) roll

Length - 1 ply @ 240 ft. standard

- 2 ply @ 125 ft. standard

- 3 ply @ 85 ft. standard

### Inserted Media (validation)

Number of plies - 4 with interleaved carbons (0.014  
   in. max thickness)

Height - 2 3/4 in. min.

Width - 5 1/4 in. min.

### Ribbon

Snap in cassette

**NOTE:** Warranty may be voided if other than genuine Ithaca Peripherals, Okidata, or Ithaca approved ribbons are used.

### Physical

Width - 6 3/4 in.

Length - 11 1/2 in.

Height - 7 in.

Weight - 8 1/2 lbs.

### Environment

Operating temperature -40° to 105° (5° to 40°C)

Operating humidity        -20 to 90% Rh

Storage temperature      -40° to 160° (5° to 70°C)

### Reliability

Mean time between failures - 25,000 hours

Mean time to repair - 15 minutes

Printhead life cycle - 200 million characters

### Input Power

Voltage - 12, 220, or 240 VAC  $\pm$ 10% (specify  
   voltage with order)

Frequency - 50 or 60 Hz  $\pm$ 3Hz

Programmers Manual Part Number 50-7047

### Bar Codes Resident In Firmware

Interleaved 2 of 5

Code 39

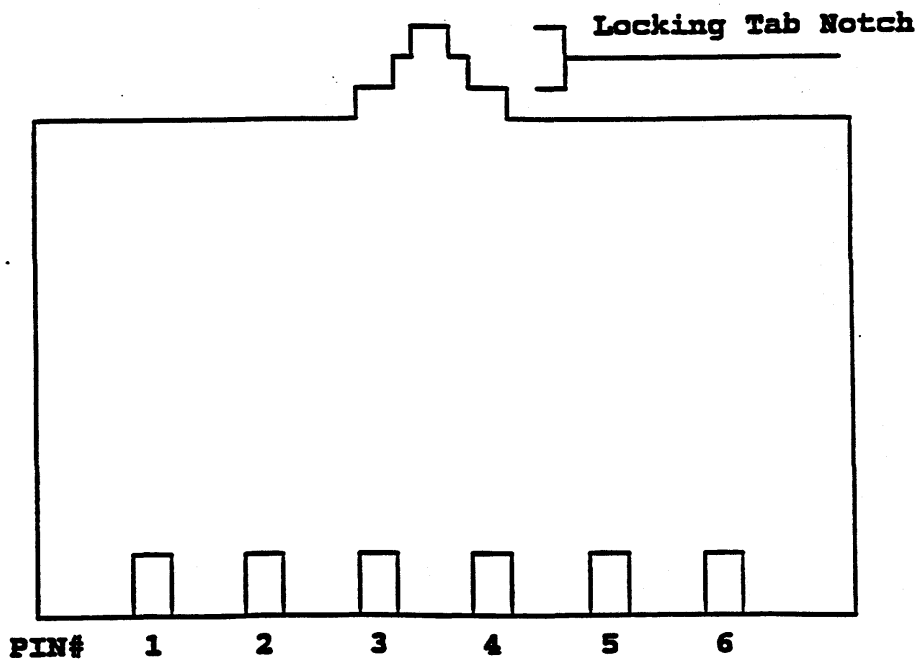
Code 128

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**APPENDIX F**  
**(RJ11) WIRING DIAGRAM**

## FEMALE MODULAR CONNECTOR ON THE BACK OF THE 50PLUS SERIES PRINTER

- 1-Drawer 2 drive signal (+24V 150 ms)
- 2-Ground
- 3-Drawer 1 drive signal (+24V 150 ms)
- 4-Drawer 1 status switch input
- 5-ground
- 6-Drawer 2 status switch input



**APPENDIX G**  
COMMAND PRIORITY TABLE  
TURBO EMULATION PRINTER MODE





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