Programmer's Manual

Monarch® 6017™ HandiPrint™ Printer
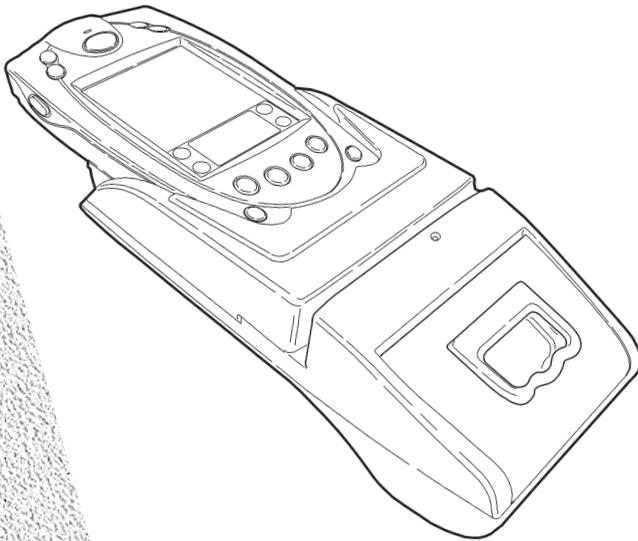
Monarch®

PAXAR

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WARNING

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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INTRODUCTION

The Monarch® 6017™ HandiPrint™ printer works with application programs written for the SYMBOL® SPT® 1700 or PPT® 2700 handheld computers ("handheld"). The handheld/printer combination is suitable for retail printing applications.

The printer control language contains commands to

- create and print formats.
- configure the printer.
- enable the use of certain printer features.

The application writes a data stream of commands (in the printer's control language) to the printer. It writes these commands either directly or through the Symbol Application Programming Interface (API). For information about the API, refer to Symbol's Web site (www.symbol.com).

This manual describes the printer's control language.

Duty Cycle

The HandiPrint 6017 printer is designed to print up to 1000 inches per day. The average print rate is 1 inch every 10 seconds at a text character print density of 25% (i.e., one character printed out of every four positions). Bar codes and graphics are more dense (print with more dots) than text and may need a lower duty cycle. If the duty cycle is exceeded, the printer may not print all of the information that was sent to it.

Conventions Used in this Manual

Following are the conventions used in the syntax descriptions of each command.

Symbol	Description
-	Separates items in the command sequence.
< >	Indicates a variable with a single-byte value.
' '	Indicates the value is a literal. Enter the value as it appears or use the ASCII hex values for the same characters.
( )	Indicates a variable of any length.
# #	Indicates a variable of an exact length.
ESC	Indicates the beginning of a command sequence. Enter **1B** hex for this item.
CR-LF-NAK	Indicates the end of a response from the printer. In the response, it is represented as **0D 0A 15** hex.

These conventions make it easier for you to read the commands' syntax descriptions. They are not part of the data streams. For example, ESC-'F1' may be the syntax description, but the application substitutes **1B** for ESC. Also, - and ' (and other such characters described here) are not part of the data stream.

The printer ignores commands with syntax errors.

CREATING AND PRINTING FORMATS

<div style="text-align: right">**2**</div>

A format is the design of what your application prints. It consists of fields placed at various locations on the format. Fields can contain text, graphics, and bar codes.

This chapter describes how to create a format.

Overview

To create a format:

1. Draw a rough sketch of how you want the format to look. For example, a graphic may appear at the top, followed by the name of your organization, followed by a list of items purchased. Your format could be organized any number of ways.

> There are .157-inch no-print zones on the left and right sides of the format, and a .7-inch no-print zone at the top of the format.

2. Code the commands to implement your format design, as described in this chapter.

3. Add any commands to the data stream related to how the printer performs. For example, at the data stream's beginning, enter the command to initialize the printer (18 hex).

4. Embed the data stream in the application and test what you have written.

Creating Text Fields

Text fields can contain letters, numbers, and symbols. To specify text for the format, write the text directly to the printer. There is no special command to use. There are, however, commands/control characters to select a character set to use and to format the text.

Selecting Character Sets

The printer can use the ANSI or ASCII character sets. These character sets are preloaded in the printer. ANSI characters are the default.

You can modify character sets/fonts resident in the printer. See "Modifying Resident Fonts."

Character Exceptions

Both character sets have missing characters. The ↑ and ↓ characters replace ⌐ and ¬, respectively; the ố character replaces α.

Command Summary

Command	Description
ESC-'F1'	Selects ANSI characters.
ESC-'F2'	Selects ASCII characters.

F1 and F2 are two-character strings, not the familiar notation for function keys 1 and 2.

Formatting Text

For the text on your format, you can choose the font, its size, spacing, and style (normal or bold).

Command Summary

Command	Description
1C hex (Extend)	Prints characters twice as high as normal.
1D hex (Extendoff)	Stops printing characters twice as high as normal.

Command	Description
ESC-'k'-<font>	Selects a font. Standard Bold is the default.
<font>	**0** Large Rotated (90 degrees clockwise)
	1 Large Normal
	2 Standard Bold
	3 Standard Normal
	4 Reduced Bold
	5 Reduced Normal
ESC-'U'-<mode>	Turns bold printing on or off.
<mode>	**0** Turn off bold printing.
	1 Turn on bold printing.
ESC-'a'-<space>	Specifies the amount the space for the printer to leave between lines of text.
<space>	**0-10** The amount of space (in increments of .125 mm). The default is **3** (.375 mm).
Example: ESC-a2	Sets the space between text lines to .25 mm.

Creating Graphic Fields

The printer can print bitmap graphics from

♦ data streams

♦ flash memory.

You use the same commands for both methods. However, if you use a data stream, you must recreate the graphic every time you want to print it. If you put the graphic in flash memory, you create it only once, and then retrieve it when you want to print it.

Using Data Stream Graphics

You print data stream graphics one line at a time. To create a line, you specify bits to turn off or on. Bits turned off represent white space, and bits turned on represent part of the graphic. There is a .125 mm gap between consecutive lines.

Command Summary

Command	Description
ESC-'V'-01 hex-00 hex-#data#	Prints a graphic line.
#data#	72 hex bytes, indicating the dots to turn on or off. For example, if a specified byte is FF, all the dots are on. If it is 01, only one dot is on, and the other 7 are off.
	If you accidentally specify less than 72 bytes, the printer does not print the graphic. If you specify more than 72 bytes, a fatal exception occurs.

You do not directly specify the bits turned on or off.
You specify the bits in groups of eight by using hex
values.

Example

This line of code prints a solid horizontal line of dots.

```
ESC-V-1-0-
FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
FFFF
```

Using Flash Memory Graphics

You can also use a graphic previously stored in flash memory. You are limited to one graphic stored in memory at a time. Saving a graphic to flash memory when there is already one there overwrites the previous one.

To store a graphic in flash memory:

1. Remove the printer's battery and wait several seconds.

2. Re-insert the battery and enter Download Mode immediately (see below). It takes two commands to make the transition to Download Mode. Design the application so that it waits to send the second command until the printer responds to the first command by returning a '?' character.

3. Transmit the graphic one line at a time, using a graphic created as described in "Using Data Stream Graphics."

4. Save the graphic to flash memory (see below). When it receives the command, the printer returns a 'D' character, and begins the save. When the save is complete, the printer transmits an '!' character, and then an 'X' character every 500 milliseconds.

5. Remove the printer's battery and wait several seconds before replacing it.

Command Summary

Commands	Description
ESC-'DL'	Step 1 of entering Download Mode. After processing this command, the printer returns a '?' character.
ESC-'LG0'	Step 2 of entering Download Mode. Any character not accepted as part of this command is sent back the handheld.
ESC-'LG'-FF hex	Saves the graphic. After receiving this command, the printer returns a 'D' character, and then saves the graphic. When finished, the printer sends an '!' character, then it sends an 'X' character every 500 milliseconds.
ESC-'Lg0'	Prints the graphic stored in flash memory.
ESC-'V'-<low>-<high>-#data#	Prints a number of graphic lines.
<low> and <high>	The hex digits (listed backward) of a number indicating how many lines to print. For example, to print 10 lines, <low> is A, and <high> is 0.
#data#	72 hex bytes, indicating the dots to turn on or off. For example, if a specified byte is FF, all the dots are on. If it is 01, only one dot is on, and the other 7 are off. If you accidentally specify less than 72 bytes, the printer does not print the graphic. If you specify more than 72 bytes, a fatal exception occurs.

Note that you are not directly specifying the bits turned
on or off. You are specifying the bits in groups of eight
by using two digit hex values.

Creating Bar Code Fields

The printer can print the following bar codes, with or without human-readable data.

♦ Code 39

♦ Codabar

♦ Interleaved 2 of 5

♦ Code 128 (UCC/EAN-128)

♦ UPC/EAN/JAN

Command Summary

Command	Description
ESC-'z'-<bctype>-<length>-<height>-<data>	Prints a bar code without human-readable data.
ESC-'Z'-<bctype>-<length>-<height>-<data>	Prints a bar code with human-readable data.
<bctype>	The type of bar code to print (values are the ASCII representation, not hex). **'1'** Code 39 **'2'** Code 128 (UCC/EAN-128) **'3'** Interleaved 2 of 5 **'4'** UPC/EAN/JAN **'5'** Codabar
<length>	The data length, specified in hex. This value is dependent on the bar code you choose with <bctype>. See "Specifying Particular Bar Codes."

Command	Description
<height>	The bar code height, specified in hex, in increments of .125 mm. <height> can be no smaller than **14**. For example, 14 = 2.5 mm, 15 = 2.625 mm, etc.
	For UPC/EAN/JAN bar codes, the height you specify includes a 1.25 mm drop bar pattern after the bar code.
(data)	The data for the bar code. It must equal <length>. See "Specifying Particular Bar Codes" for data restrictions, which vary by bar code.

Specifying Particular Bar Codes

Values for the <length> and <data> parameters depend on the type of bar code you choose with <bctype>.

Bar Code	<length>	<data>
Code 39	9 (maximum)	0-9, A-Z, -, (space), $, /, +, and %
Interleaved 2 of 5	24 (maximum)	Pairs of numeric characters (0-9)
UPC/EAN/JAN	UPCA: 12 UPCE: 7 EAN/JAN-8: 8 EAN/JAN-13: 13 These lengths are fixed and all include a check digit.	0-9
Codabar	20 (maximum) plus start and stop characters. The printer adds the stop character automatically.	Data: 0-9, $, -, :, /, ., and +. Start: a (the default), b, c, or d.

Code 128 (UCC/EAN-128) Details

For Code 128 (UCC/EAN-128) bar codes, <length> can be a maximum of **18** (with alphanumeric/control code data) or **36** (if you use subset C and numeric pairs).

The first character of <data> must specify the subset to use: A, B, or C (listed as 87, 88, and 89 hex, respectively). The rest of the data can be all 256 ASCII characters by using a combination of the subsets. The data must appear as numeric pairs corresponding to the hex values for the ASCII character in question.

Each subset enables the bar code to contain different characters. Subset A uses 20-3F hex and 40-7F hex (read by a bar code reader as 00-7F hex), subset B uses 20-7F hex, and subset C uses 30-39 hex.

The following table explains how to switch from one subset to another.

Character	Subset A	Subset B	Subset C
80 hex	Function 3	Function 3	
81 hex	Function 2	Function 2	
82 hex*	Shift	Shift	
83 hex	Switch to Subset C	Switch to Subset C	
84 hex	Switch to Subset B	Function 4	Switch to Subset B
85 hex	Function 4	Switch to Subset A	Switch to Subset A
86 hex	Function 1	Function 1	Function 1

* A temporary, one character shift to another subset.

The following table describes the purpose of each function.

Function Number	Purpose
1	Uses reserved Code 128 characters (UCC/EAN128).
2	Appends data (subsets A and B only).
3	Initializes a bar code reader.
4	Extends characters. For example, 'a' (97 decimal) is changed to 'β' (225 decimal) by adding 128 to it. This function is unavailable in subset C.

Positioning Fields

The following commands/control characters move the supply through the printer to position the fields on the format. The application can also write spaces to the printer before it prints text to position a field.

There are .157-inch no-print zones on the image area's right and left sides and a .7-inch no-print zone at the top.

Command Summary

Command	Description
D hex (CR)	Advances to the beginning of the next line.
C hex (FF)	Advances 10 lines.
14 hex (Norm)/F hex (SI)	Sets the printer to 48-column mode.
E hex (SO)	Sets the printer to 24-column mode.
B hex (VT)	Advances 5 lines.
9 hex (HT)	Tabs to the next position or the beginning of the next line.
A hex (LF)	Advances to the beginning of the next line.
ESC-'J'-<num>	Performs a specified number of line feeds.
<num>	**1-FF** The number of line feeds, specified in hex. The default is **1** (.125 mm).

CONFIGURING THE PRINTER

There are several commands for configuring the printer. You can include these commands at any place in a data stream. This chapter describes these commands.

Selecting the Operating Mode

The printer works in either online or buffer mode. In online mode, the printer prints characters as soon as they are received. In buffer mode, the printer receives and stores characters, and then prints them upon receipt of an EOT control character (4 hex).

Command Summary

Command	Description
ESC-'P#'	Selects online mode.
ESC-'P$'	Selects buffer mode.

Setting the Print Contrast

You can increase or decrease the print contrast for lighter or darker print. This setting affects the print speed (the higher the contrast, the lower the speed and vice versa). The print contrast also depends on the battery voltage.

We recommend designing your
applications so the user can adjust
the print contrast.

Command Summary

Command	Description	
ESC-'P'-<value>	Sets the print contrast.	
<value>	**0-9**	**0** is the highest contrast and **9** is the lowest contrast. The default is **5**.

Setting the Power Mode

The printer can operate in five different power modes, each using a different number of printhead sections, which are groups of dots on the printhead. The mode selected also affects the print speed (the more printhead sections used, the faster the printer speed and vice versa).

Command Summary

Command	Description
ESC-'P'-<value>	Sets the power mode.
<value>	The number of printhead sections to use, specified in hex.
	1 Use one printhead section.
	2 Use two printhead sections.
	3 Use three printhead sections.
	6 Use six printhead sections.
	7 Default. Dynamically choose the number of printhead sections to use (1, 2, 3, or 6), depending on what is printed.

Checking the Battery Voltage

The following commands/control characters involve the printer's battery.

> We recommend designing your applications so the user can check the printer's battery voltage.

Command Summary

Command	Description
ESC-'P^'	Prints the battery voltage.
ESC-'P!'	Requests the battery voltage from the printer.

Command	Description
16 hex (Ctrl-V)	Requests the print buffer and battery statuses. The printer responds with:
	ESC-'B'-#pbchars#-CR-LF-ESC-'V'-#volts#-CR-LF-ESC-'M'-#card#-CR-LF-NAK

	#pbchars#	The number of characters currently in the print buffer, shown as four ASCII hex digits, which are "OR'd" with 30 hex.
	#volts#	Four ASCII decimal digits. The first three are the battery voltage (form x.x).
		The fourth character categorizes the voltage listed to give it a reference. Values are 1-4, where 1 is high and 4 is low.
	#card#	Four ASCII hex digits (which are "OR'd" with 30 hex) representing the time left before the printer enters sleep mode.

Using the Power-Off Timer

The printer has a power-off timer to conserve battery life. After a specified period of inactivity occurs, the printer goes into sleep mode. This feature is similar to the Auto-Off feature on your handheld.

The printer returns to normal mode when it starts receiving commands again, but the countdown re-starts after every character received.

Before powering down, the printer transmits Auxon then Xoff.

Command Summary

Command	Description
ESC-'M'-<digit1>-<digit2>-'0'-CR	Sets the power-off timer's inactivity period.
<digit1> and <digit2>	**0-9** The first and second digits, respectively, of the number of seconds to set the inactivity period to. To disable the timer, set both parameters to 0.
Example:	
ESC-M560-CR	Sets the inactivity period to 56 seconds.
ESC-'C'	Sets the inactivity period to the default (20 seconds).

Be careful when using sleep mode
with buffer mode. If there is data
in the print buffer when the printer
goes into sleep mode, you lose
the data.

Supply Control Commands

The commands in this section control how the printer uses black-mark supplies.

Be aware of the features of your supplies (distance between black marks, existence of any preprinted text, etc.) as you code these commands. For example, you may have to code the black mark search command multiple times if the marks are farther apart than the maximum search allows.

Command Summary

Command	Description
ESC-'QJ'-<lines>	Moves the printer backward in .125mm line increments.
<lines>	**00 hex –** The number of lines to move. **FF hex**
ESC-'QQ'-<lines>	Specifies the number of .125mm lines to continue printing after failing to detect a black mark.
<lines>	**00 hex –** The number of lines to print. The **FF hex** default is **28 hex**.
ESC-'QF'-<max>	Searches for a black mark, advancing in .25mm line increments.
<max>	**00 hex –** The maximum number of lines to **FF hex** move.
ESC-'QB'-<max>	Searches for a black mark, moving backward in .25mm line increments.
<max>	**00 hex –** The maximum number of lines to **FF hex** move.

Printer Responses

The printer responds to the two black mark search commands, with either of the following sequences.

Command	Description
ESC-'Q'-3F hex-3F hex-#high#-#low#	Black mark found.
ESC-'Q'-30 hex-30 hex-#high#-#low#	Black mark not found.

#high#	**30 hex –** **3F hex**	The left digit of the hex number representing the number of lines moved to find the black mark.
#low#	**30 hex –** **3F hex**	The right digit of the hex number representing the number of lines moved to find the black mark.

Checking Version Information

Your application can check the versions of both the printer's hardware and firmware.

Command Summary

Command	Description
ESC-'P('	Requests the firmware version. The printer responds with:
	ESC-'('-#version#-CR-LF-NAK
	#version# Four ASCII characters representing the firmware version.
ESC-'P)'	Requests the hardware version. The printer responds with:
	ESC-')'-'099'-<version>-CR-LF-NAK
	<version> An ASCII character representing the hardware version.

Communicating with the Handheld

The printer and handheld cannot communicate unless they use these communication parameter values:

- **Baud Rate** - 19200
- **Stop Bits** - 1
- **Parity** - None
- **Data Bits** - 8
- **Flow Control** – RTS/CTS

The following control characters are related to communications between the printer and the handheld.

Command Summary

Command	Description
12 hex (Auxon)	Sent by the printer to indicate the printer is online (transmitted upon initial power up, a paper reload, or clearing of a paper jam).
15 hex (Auxoff)	Sent by the printer just before a power down or when the supplies run out.
11 hex (Xon)	Sent by either device to indicate it is ready to receive data.
13 hex (Xoff)	Sent by the receiving device to indicate the transmission must end.

Miscellaneous Control Characters

Command Summary

Command	Description
18 hex (Cancel)	Re-initializes the printer. We recommend you begin all data streams with this command.
8 hex (BS)	Removes the last character entered in the print buffer.
4 hex (EOT)	Sent by the printer to indicate the buffer is empty and the printer is idle.

MODIFYING RESIDENT FONTS

4

You can modify the printer's resident fonts by redefining the characters. To modify a font, perform the tasks in the following sections (in the order the sections are listed).

Each time you modify a font, it replaces the current font definition. The only way to return to the default font is to reload the original definition.

Font Sizes

Before you start, take note of the maximum size of characters in the font you want to use.

Number	Name	Character Size (w x h)
0	Large Rotated (90 degrees clockwise)	14 x 16
1	Large Normal	16 x 21
2	Standard Bold	12 x 21
3	Standard Normal	10 x 21
4	Reduced Bold	9 x 21
5	Reduced Normal	8 x 21

Defining New Characters

You must define each new character separately, performing the following procedure for each one.

1. Define the character in a matrix. The matrix size depends on the font you use (see "Font Sizes"). Think of the matrix as a bitmap showing the character's design. Following is an example.

Left Byte   **Right Byte**

7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0

Leave at least one column blank to the character's right
so character strings do not run together.

---

2. Translate each line into two bit sequences (left byte/right byte), where an empty square is 0, and a filled-in square is a 1. For example, the second line from the top is 00000000 01000000.

3. Convert each bit sequence into two hex characters. For example, the second line from the top is 00 40.

The Next Step

You have now defined the new character you want to create. The next step is to select the character set to load it in.

Selecting Character Sets

Before selecting a character set, remove the printer's battery and wait several seconds. Then, replace the battery and immediately use one of these commands to select the character set to modify.

When it receives either of these commands, the printer copies the character set to memory, then sends a '?' character to the handheld.

The printer returns any characters not accepted as part of this command.

Do Not send any commands to the printer between turning it on and selecting the character set.

Command Summary

Command	Description
ESC-'DA0'	Selects characters from the ASCII character set (**33-127**).
ESC-'DX'-<charfont>	Selects characters and fonts from the Extended ASCII or ANSI character set (**128-255**).
<charfont>	**0** Extended ASCII characters − Large Rotated, Large Normal, and Standard Bold fonts.
	1 Extended ASCII characters − Standard Normal, Reduced Bold, and Reduced Normal fonts.
	2 ANSI characters −Large Rotated, Large Normal, and Standard Bold fonts.
	3 ANSI characters −Standard Normal, Reduced Bold, and Reduced Normal fonts.

The Next Step

You have now selected the character set you are modifying. The next step is to load the character into the set.

Loading New Characters

This step allows you to load the new characters at a particular position in the set.

Command Summary

Command	Description
<ESC>-'D'-<font>-<code>-<matrix>	Loads a character at a particular position.
<font>	The font to save the character in.

Value	ASCII Fonts	Extended ASCII and ANSI Fonts
0	Large Normal Standard Bold	Large Normal Standard Bold Standard Normal
1	Standard Normal	Large Rotated Reduced Bold Reduced Normal
2	Reduced Bold Reduced Normal	

<code>	The hex character code for the new character: **21 hex** – **7F hex** (ASCII) or **80 hex** – **FF hex** (Extended ASCII and ANSI).
#matrix#	The hex data from the matrix describing the new character (see "Defining New Characters").

The Next Step

You have now modified the character set. The next step is to save the font.

Saving Modified Fonts

To save the modified font into flash memory, use ESC-'D'-FF hex. When the fonts have been saved, the printer sends a '!' character to the handheld. Then, it sends an 'X' character every 500 milliseconds.

Next, remove the battery and wait several seconds before replacing it.

USING THE MAGNETIC CARD READER

Optional. Your printer may have a magnetic card reader, which reads up to three tracks of magnetically encoded data from cards conforming to the ANSI/ISO 7810 and 7811 standards. After reading the data, the printer returns the information to the handheld.

Before preparing the reader for a swipe, the handheld wakes the printer up by sending a few characters to it. The printer responds with XON to indicate the reader is ready.

Command Summary

Command	Description
ESC-'M'-#timer#-<tracks>-CR	Prepares the reader for a magnetic card swipe. The reader's LED turns on when the printer receives this command, indicating it is waiting for the operator to swipe the card. On a successful swipe, the LED goes out.
#timer#	Sets the reader's timer. If the operator does not swipe the card through the reader before the timer runs out, an error occurs. Values are **00-99** (seconds). **00** disables the timer.
<tracks>	The combination of tracks to read.
	1 Track 1 only.
	2 Track 2 only.
	3 Track 3 only.
	4 Tracks 1 and 2 together.
	5 Tracks 2 and 3 together.
	6 Tracks 1, 2, and 3 together.

Command	Description
	The reader responds to the read command with: #trck#-(data)-'?'-CR-LF-NAK
	#trck# Track indicator. Values are **%**/**1**/ (track 1), **;**/**2**/ (track 2), and **+**/**3**/ (track3).
	(data) The data read from the card. This field can be empty. If an error occurs, this field contains an E character and the error message text (see "Error Messages").
2 hex (Ctrl-B)	Requests the print buffer and card reader statuses. The printer responds with: ESC-'B'-#pb#-CR-LF-ESC-'M'-#sleep#-CR-LF-NAK
	#pb# The number of characters currently in the print buffer, shown as four hex digits, which are "OR'd" with 30 hex.
	#sleep# Four ASCII hex digits (which are "OR'd" with 30 hex) representing the time left before the printer enters sleep mode.
ESC-'C'	Cancels the reading process.

Error Messages

Following is the format of the data returned when an error occurs with the magnetic card reader. When an error occurs, the reader's LED blinks once.

Syntax	Description
'%'-'E,'-#error#-','-(text)- CR-LF	Indicates an error occurred.
#error#,(text)	Error number and corresponding text.
	05 **Timeout Expired.**
	07 **Invalid Track Number.**
	08 **Unsupported Track Selected.**
	09 **Cancel Request.**

Considerations

♦ We recommend designing your applications so the user can manually enter data when the reader cannot read a card.

♦ Keep the value for the timer long enough to allow the swipe, but small enough to not allow multiple swipes. If multiple swipes are done (with different cards) and each uses different tracks to store data, the data sent back to the handheld will be a mixture from the two cards.

USING THE BAR CODE SCANNER   6

The operator can use the handheld's scanner indirectly from buttons on the printer. This functionality must be built into the application.

The printer **does not** do the scanning. It communicates with the handheld, indicating the operator is pressing the printer's scanner buttons, and the handheld should activate the scanner.

The application must integrate these commands with the commands running the scanner. For example, using the API commands, the application must enable the scanner and define the connection to the printer buttons before performing the scan.

The interaction between the printer and handheld goes as follows:

1. The application defines the data the handheld expects from the printer to indicate the printer's button(s) are being pressed.

2. When the operator presses the printer button(s), the printer automatically sends the data indicating the buttons are being pressed.

3. When the operator releases the printer button(s), the printer automatically sends the data indicating the buttons have been released.

4. The handheld disables the printer's scanner buttons.

Command Summary

Command	Description
ESC-'Y'-(on)-(onstring)-(off)-(offstring)	Defines what data the handheld expects from the printer to indicate the printer buttons are being pressed, and when they are not.
(on)	The number of characters in (onstring).
(onstring)	The data indicating the buttons are being pressed.
(off)	The number of characters in (offstring).
(offstring)	The data indicating the buttons have been released.
Example	
ESC-'Y'-'2'-'ON'-'3'-'OFF'	Specifies to enable/disable the scanner buttons with the words ON and OFF.
ESC-'Y00'	Disables the printer's scanner buttons.

SAMPLE APPLICATION

This appendix describes a sample application that prints the following sales receipt.

```
                        Paxar/Monarch
                        170 Monarch Ln.
                      Miamisburg, OH 45342
                      Phone: (937) 865-2123

                        SALES RECEIPT

           Description            Qty.      Total
           1. Monarch 9490         5        3495
           2. Monarch 9403         4         995
           3. Monarch 6035         3        4995
           4. Monarch 6030         2        2995
           5. Monarch 9450         1         995
                                             -----
                            Total          13475
           AMEX 37xvz55xx315001
           Exp. Date 10/01
```

Application Code

The printer's data stream is integrated with the commands that make up the handheld's application. For example, the application must define and initialize variables, open the serial port and allocate memory before it sends the data stream to the printer.

```
Dim ESC                             'Declare variables
Dim CR
Dim CmdString
Dim Buffer
Dim BufferSize
Dim iSerialPort
Dim iReturn
Dim CRLF
Dim LF
Dim NAK
Dim Byte
Dim String

ESC = Chr(27)                       'Initialize variables
CR = Chr(13)
CRLF = Chr(13) & Chr(10)
LF = Chr(10)
NAK = Chr(21)
Byte = ""
String=""

LPrint(Chr(24))                     'Reinitialize Printer
LPrint(ESC & "P#")                  'Online Mode
LPrint(ESC & "F1")                  'ASCII Chars
LPrint(ESC & "k3")                  'Font 3
LPrint(ESC & "A0")                  'Zero space between lines
```

```
                                        'Set up data stream
CmdString = ESC & "P#" & CRLF & CRLF
CmdString = CmdString & "            Paxar/Monarch" & CRLF
CmdString = CmdString & "            170 Monarch Ln." & CRLF
CmdString = CmdString & "         Miamisburg, OH 45342" & CRLF
CmdString = CmdString & "         Phone: (937) 865-2123" & CRLF & CRLF
CmdString = CmdString & "            SALES RECEIPT" & CRLF & CRLF
CmdString = CmdString & "Description       Qty.    Total" & LF
CmdString = CmdString & "1.Monarch 9490    5       3495" & LF
CmdString = CmdString & "2.Monarch 9403    4        995" & LF
CmdString = CmdString & "3.Monarch 6035    3       4995" & LF
CmdString = CmdString & "4.Monarch 6030    2       2995" & LF
CmdString = CmdString & "5.Monarch 9450    1        995" & LF
CmdString = CmdString & "                          -----" & LF
CmdString = CmdString & "         Total        13475" & CRLF & CRLF
CmdString = CmdString & "AMEX 37xvz55xx315001" & LF
CmdString = CmdString & "Exp. Date 10/01" & CRLF & CRLF & CRLF
CmdString = CmdString & ESC & "z1" & Char(6) & Chr(64) & "123456"
CmdString = CmdString & LF & Chr(12)
CmdString = CmdString & "" & LF
CmdString = CmdString & "" & LF


                                        'Allocate the port
iSerialPort = SerialPortAllocate()
iReturn = SerialPortOpenText(iSerialPort, 0, 19200, CRLF, CRLF)
iReturn = SerialPortConfigure(iSerialPort,19200,8,"None",1,"Hardware")


BufferSize = 512 + 32                   'Allocate buffer
Buffer = MemoryAllocate(BufferSize)
iReturn = SerialPortSetBuffer(iSerialPort, Buffer, BufferSize)


                                        'Send data stream
iReturn = SerialPortWriteString(iSerialPort, CmdString)
While Byte <> NAK                       'Wait for response
  Byte = SerialPortReadString(iSerialPort, 1)
  if Byte = NAK then exit while
  String = String & Byte
Wend
MsgBox(String)
```

```
Buffer = MemoryFree(Buffer)          'Deallocate the port
iReturn = SerialPortClose(iSerialPort)
iReturn = SerialPortFree(iSerialPort)

LPrint(Chr(12))                      'Form feed
MsgBox("Done")                       'Finish up
If ClosePort() = false then
   MsgBox("Close Failed")
EndIf
```

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