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# ***SnapShot<sup>®</sup> Decoded***



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## **User's Guide**

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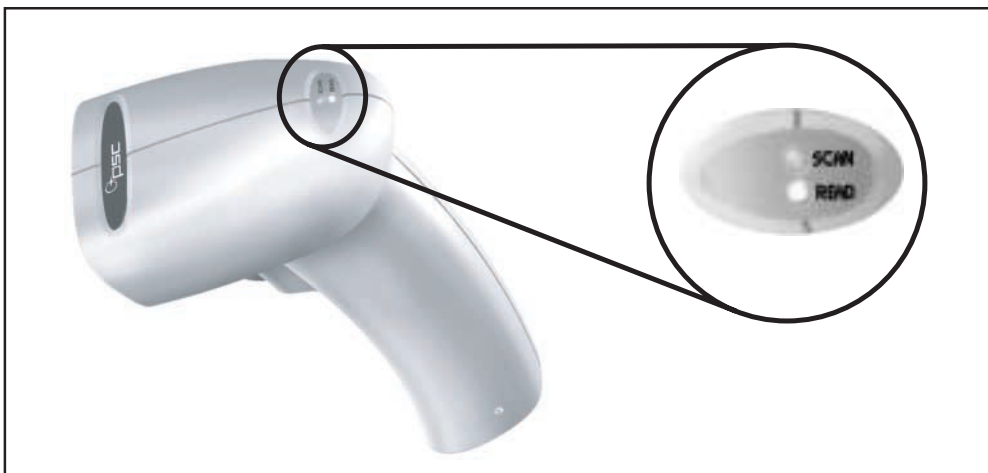
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# About the SnapShot

The SnapShot is a lightweight yet rugged bar code scanner (see Figure 1). It is available in decoded and undecoded models. Decoded models can be connected to any supported PC or terminal as either a keyboard wedge or a serial device. Undecoded models must be used with PowerWedge™ fixed-station decoders (or similar decoders) or with portable data-collection terminals (such as the PT 2000™).

A red light-emitting diode (LED) on the top indicates when the scanner is scanning, and a green LED indicates when a scan is successful (see Figure 1). The decoded models also emit a beep each time a bar code is scanned successfully. You can change the beeper's volume, pitch, and duration to suit your work environment or your personal preferences.

**Figure 1. The SnapShot**



An optional stand is available for the scanner. The stand lets you mount the scanner at variable positions for hands-free scanning. (The enhanced-performance scanner model is recommended for use with the stand.)

## Bar Code Symbologies

The scanner decoded models recognize and decode the following symbologies:

- Codabar/Ames
- Code 11
- Code 128
- Code 39/Extended ASCII
- Code 93
- EAN-8/13
- Interleaved 2 of 5
- JAN-8/13
- Labelcode 4/5
- Matrix 2 of 5
- MSI
- Standard 2 of 5
- UPC-A
- UPC-E
- UPC/EAN/JAN extensions



### NOTE

The symbologies listed were supported at the time this user's guide was printed. Additional symbologies may also be supported, while some of the symbologies listed may be discontinued. Please contact your dealer or Customer Service for current information.

## Supported Computers and Terminals

The scanner may be used with the following computers or terminals:

- ADDS
- Data General D213, D413
- DEC
- Decision Data 3496, 3781
- IBM 3151, 3180, 3191, 3192, 3196, 3197
- IBM-compatible PC/XT/AT and PS/2
- IDEA 276, 277, 486, 487
- I/O Corp 2476
- Macintosh
- NCR 2900
- NEC PowerMate
- TeleVideo 935, 965, 9065, 9320
- Telex 1196, 1472, 1476, 180-1

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# Using the SnapShot

This section and the rest of this user's guide describe how to use the decoded models of the SnapShot. If you are using an undecoded model, please refer to the user's guide that came with it.

## Connecting the Scanner to Your Computer or Terminal

The scanner can be connected to a serial port on your computer or terminal. You can also use the scanner as a keyboard wedge.



**NOTE**

**The interface cable you need to use with your scanner depends on the type of connection (serial or keyboard wedge) and the type of computer or terminal you are connecting it to. Be sure you have the correct cable before beginning the installation. (Contact your dealer or Customer Service for information.)**

## Serial Installation

The scanner can be connected directly to a computer (stand-alone configuration). It can also be installed between a workstation and its host computer (eavesdrop configuration).

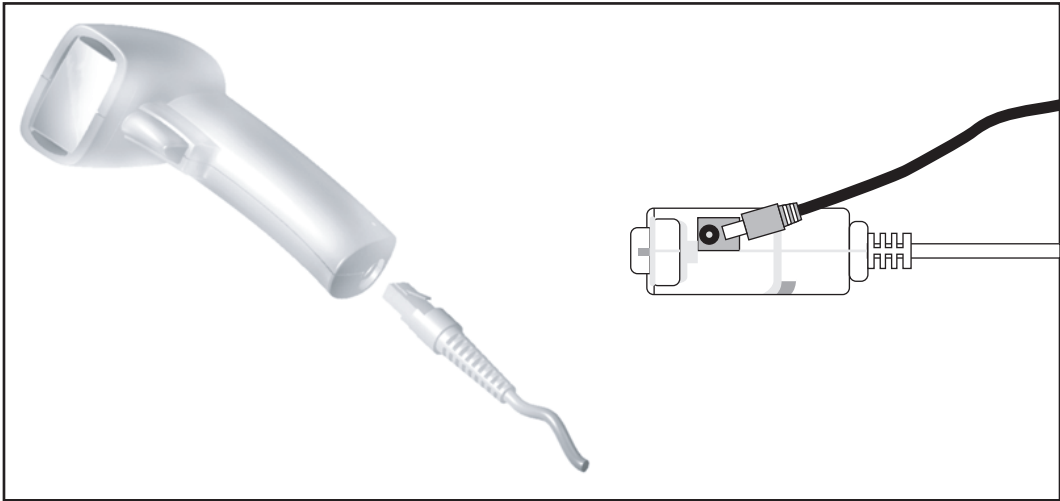
### Stand-Alone Configuration

This installation requires cable #00-343-00 (9-pin connector) or #00-344-00 (25-pin) and power adapter #00-896-00. Complete the following steps:

1. Turn your computer off.

2. Insert the cable's RJ plug into the socket on the scanner's base (see Figure 2).
3. Attach the connector on the other end of the cable to an available serial port on your computer.
4. Attach the small, round plug of the power adapter to the power input jack on the cable connector (see Figure 2). Plug the other end into an outlet or power strip (preferably one that has surge protection).

**Figure 2. Attaching the Cable and Connecting the Power Adapter**



5. Turn your computer on.
6. Scan the following bar code to set the scanner for serial operation:



## Eavesdrop Configuration

This installation requires two cables: #00-345-00 and a cable made specifically for your model of computer or terminal. It also requires power adapter #00-896-00. Complete the following steps:

1. Turn your computer or terminal off.
2. Insert the cable's RJ plug into the socket on the scanner's base (see Figure 2).
3. One connector on the eavesdrop cable is labeled with the cable number. Connect the free end of the scanner cable to that connector.
4. Locate the cable that connects your computer or terminal to the host. Unplug that cable from the computer or terminal's serial port, and attach it to the connector labeled COMPUTER on the eavesdrop cable.
5. Attach the connector labeled TERMINAL on the eavesdrop cable to the computer or terminal's serial port.
6. Attach the small, round plug of the power adapter to the power input jack on the scanner cable connector (see Figure 2). Plug the other end into an outlet or power strip (preferably one that has surge protection).
7. Turn your computer or terminal on.
8. Scan the following bar code to set the scanner for serial operation:




## Keyboard Wedge Installation

This installation requires cable #00-340-00 (standard AT connectors) or #00-341-00 (PS/2-style connectors), or cable #00-345-00 and a cable made specifically for your model of computer or terminal. Complete the following steps.

1. Turn your computer or terminal off, and unplug the keyboard.
2. Insert the cable's RJ plug into the socket on the scanner's base (see Figure 2).



### NOTE

On Macintosh computers, the keyboard input jacks are called Apple Desktop Bus (ADB) ports. They are marked with the following icon: 

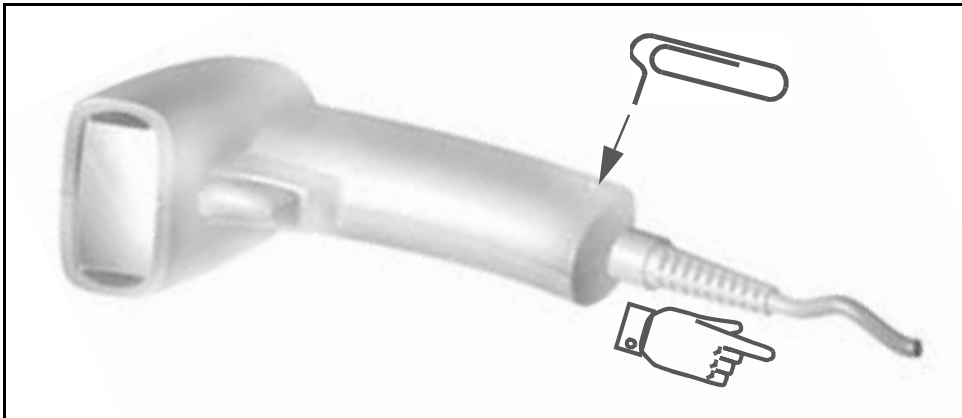
3. Plug the male connector at the other end of the cable into the keyboard input jack on the computer or terminal.
4. Plug the keyboard cable into the female connector on the scanner cable.
5. Turn on the computer or terminal.
6. Scan the programming bar code for the type of computer or terminal you are using. (The bar codes for host devices start on page 86).

## Removing the Scanner Cable

To remove the scanner cable, complete the following steps:

1. Unbend a paper clip, and place the end of the paper clip into the hole near the base of the handle (see Figure 3).
2. While pressing the paper clip in the hole, gently pull on the cable where it enters the base of the scanner. The cable should slide out of the base.

**Figure 3. Disconnecting the Cable**



## Scanning Range

The scanning range depends on the model of scanner you are using. Start with the scanner about two inches away from the label. If you do not get a good read right away, try moving the scanner closer to or farther from the label.

## Trigger Modes

The scanner has three modes of trigger operation: normal mode, autoscan mode, and multiscan mode. How you use your scanner depends on the mode you have selected. Normal mode is the default setting. To change the trigger mode, use the bar codes on page 84.

### Normal Mode

To use the scanner in normal mode, just point the scanner at the bar code you want to read, and then press the trigger. The red “Scan” LED on the top will light up. Hold the trigger down until the scanner successfully reads the bar code. This is indicated by the green “Good Read” light and a beep. Release the trigger when you hear the beep. Point the scanner and press the trigger again to read another bar code.

### Autoscan Mode

With the scanner set to autoscan mode, you press and release the trigger once to turn the unit on. You can then read several bar codes without having to press the trigger for each one. When you press the trigger again, the scanner turns off. This mode is handy for using the scanner in its optional stand.

### Multiscan Mode

With the scanner in multiscan mode, you can scan bar codes without pressing and releasing the trigger for each one. Press the trigger and hold it down while scanning the bar codes you want to read. The scanner will beep at each good read. Release the trigger when you are finished scanning.

# Programming the SnapShot

The scanner is configured with certain default parameter settings before it is shipped from the factory. These predefined defaults will work for most applications. However, you may need to customize your settings for the specific types of bar codes you will be scanning.

You can program your scanner with any of the following methods:

- Predefined-default programming—see page 9
- Auto-learn programming—see page 10
- Menu programming—see page 11
- Bar code batch programming—see page 13
- On-screen programming—see page 16
- Serial batch programming—see page 19

## Predefined Defaults

The scanner has the following sets of default parameters:

- **Predefined Default 0 (D0)** turns every on/off parameter off and sets all minimum and maximum lengths to zero. This default set makes it easy for you to start with everything off and then enable only the bar code symbologies and parameters you wish to use. This can prevent unwanted data entry to your applications.
- **Predefined Default 1 (D1)** turns every on/off parameter on, sets all minimum lengths as low as possible, and sets all maximum lengths as high as possible. It also sets preambles and postambles. This default set gives you the best chance of reading an unknown bar

code symbology. It also identifies the symbology of each bar code you scan.

- **Predefined Default 2 (D2)** is the default set that was installed in the scanner at the factory. This default set will work for most applications.



**NOTE**

The host device setting (C0) is not affected by the predefined default sets.

You can reset your scanner to a predefined default set by scanning the appropriate bar code on page 72.

## Auto-Learn

Auto-Learn is the simplest method of customizing the scanner. With Auto-Learn, you “teach” the scanner to accept the types of bar codes you use.

Current settings for the scanner remain unchanged unless they are explicitly set during Auto-Learn programming. For example, enabling Code 11 does not affect other symbologies. To disable all symbologies except the ones you want to use, program the scanner to use Predefined Default 0 (see page 9) before starting Auto-Learn.

To program the scanner using Auto-Learn . . .

1. Scan the **START** bar code below. (The bar code also appears on the last page of this user’s guide.)

START





To quit Auto-Learn mode without saving the setup, scan the E bar code and then the F bar code below, in order.

**NOTE**



2. Scan a sample of each of your bar code labels. Be sure the scanner beeps after each read. It is important that you scan each type of label (e.g., Code 39, UPC) as well as the smallest and largest bar codes (e.g., 6 characters and 10 characters) that you will want the scanner to read.
3. Save the setup by scanning the following bar code *twice*. (This bar code also appears on the last page of this user’s guide.)



## Menu Programming

This programming method makes use of a “menu” of bar codes found on the last page of this user’s guide. You can use these bar codes to enter the programming I.D. numbers and settings listed in Programming Options on page 41.

To program the scanner using the bar code menu . . .

1. In Programming Options on page 41, find the identification number (I.D. #) of the parameter you want to change.

2. Scan the **START** bar code at the top of the bar code menu on the last page of this user’s guide.



**NOTE**

If you make a mistake or “get lost” while in programming mode, scan the **ESC** bar code near the top of the menu. Then continue from step 3. To quit programming mode without saving any changes, scan the **E** bar code and then the **F** bar code in the menu.

3. Scan the bar codes for the digits of the parameter’s I.D. number. Then scan the bar codes for the setting you want to make or string you want to enter.  
For example, the I.D. number for enabling Codabar is 20, and the code for On is 1. So to turn on Codabar, you would scan **2** and **0** (for 20) and then scan **1** (for On). (For other examples, see “,” “,” and “,” below and on the next page.)
4. Save the programming changes by scanning the bar code labeled **E** in the bar code menu *twice*.

## Entering Values

To enter a value setting, you must scan two bar codes for the I.D. number and two more for the value. For example, to set a minimum length of 6 for Code 128, you would scan **4** and **1** (for I.D. #41, Code 128 minimum length) and then **0** and **6** (for the value 06).

## Entering Strings

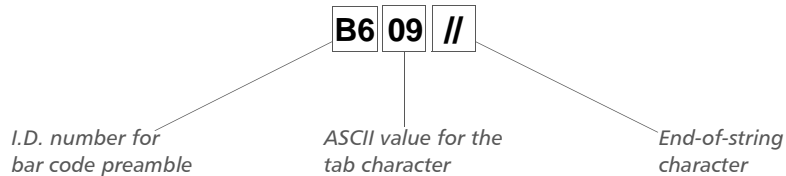


**NOTE**

Several programming functions of the scanner include the storing of string commands. These functions include the preamble, postamble, extra fields, and input editing definition-output sequences. The scanner has a limited amount of memory dedicated to storing the data characters used in string commands. The total number of characters that can be stored in all string commands combined is 120, which should be sufficient for most applications.

To enter a string (such as a preamble or postamble), look in the section, Full Keyboard Support on page 51 for the ASCII values of the characters you want to enter, and then scan the bar codes for those values. End the string by scanning the bar code for //, which is the end-of-string character.

For example, to include a tab at the beginning of every block of data you read, you would set a bar code preamble by scanning the bar codes for the following characters:



## Setting an Autoterminator

An *autoterminator* is an ASCII character that the scanner places at the end of each data transmission. You can use autoterminators to separate input with tabs, carriage returns, punctuation, or other ASCII characters.

To set an autoterminator (I.D. #B1), scan the bar codes for the ASCII value of a single ASCII character with no string terminator (//). For example, to set an autoterminator of CR (carriage return), you would enter B10D. To set no autoterminator, you would enter B100.

## Bar Code Batch Programming

Bar code batch programming uses bar codes that program the scanner with a single scan. Each batch bar code contains commands to place the scanner into programming mode, set one or more parameters, save the settings, and exit programming mode. The section, Programming Bar Codes on page 71, provides bar codes that you can use for setting many programming parameters for the scanner.



**NOTE**

To accept batch programming, the scanner must be programmed to use the extended (or full ASCII) Code 39 character set. The scanner was shipped from the factory ready to read the extended character set. If you have changed the default, scan the following bar code to enable full ASCII mode:



To program the scanner with bar codes . . .

1. Find the bar codes you need in Programming Bar Codes on page 71 (see the contents list on page 71), or create custom bar codes for the settings you want to make.
2. Scan the bar codes with your scanner.

## Guidelines for Creating Batch Bar Codes

Keep the following in mind when creating bar codes for batch programming:

- Create your programming bar codes using the standard Code 39 character set, *not* the full ASCII character set. (The scanner must read the bar codes in full ASCII Code 39 mode, however.)
- The first and last character of each bar code must be an asterisk (\*), the start and stop character for Code 39. (Most label-printing software programs automatically place the asterisks in Code 39 bar codes.)



**NOTE**

You can create the bar codes with a bar code printing program, a word-processing program, a desktop publishing program, or any other program that can use and print a Code 39 font. See the guidelines on this page.

- The first asterisk of each bar code must be followed immediately by the characters \$+\$. This lets the scanner know that it is reading programming information rather than data.
- Each bar code must end with EE and the final asterisk for the programming changes to be saved and the scanner to exit programming mode. The scanner will treat multiple bar codes of programming information as one entry as long as EE does not appear until the end of the last bar code.
- String data must appear in a programming bar code after the I.D. number for the code parameter. Use two slashes (//) to terminate the string. (Parameters that accept string data include preambles and postambles.)
- You must enter control or “action” characters (for example, tabs, line feeds, or function keys) by encoding their Code 39 equivalents (see Full Keyboard Support on page 51). For example, to enter a horizontal tab, you would include the character pair \$I in the bar code.

The following bar code provides an example of batch programming. Scanning it will turn off the autoterminator and set the maximum length for Interleaved 2 of 5 labels to 15.



Like all Code 39 bar codes, this one starts and ends with an asterisk (\*). The bar code also includes the following character combinations:

- |                |  |
|----------------|--|
| <b>\$+ \$-</b> | Starts programming mode  |
| <b>B1</b>      | The parameter I.D. number for autoterminator                                 |
| <b>%U</b>      | Turns parameter B1 off (%U is the Code 39 equivalent of the null character.) |
| <b>0A</b>      | The parameter I.D. number for Interleaved 2 of 5 maximum length              |
| <b>15</b>      | Sets parameter 0A to 15 characters   |
| <b>EE</b>      | Saves the new settings and exits programming mode                            |

# On-Screen Programming

This method lets you display programming parameters and settings on your screen. You can select parameters and change their settings using the computer's keyboard.

To program the scanner on-screen . . .

1. Open a text editor (for example, Microsoft Notepad), or go to the DOS prompt.
2. If you are using a text editor, use Courier or another monospaced font. If you are programming from the DOS prompt, type copy con nul and press **Enter**.
3. Read the following bar code with your scanner:



The on-screen programming menu should appear on your screen, as shown in Figure 4.

The menu is arranged in categories and subcategories identified by numbers and letters. Two or more categories or subcategories can share a single number or letter; for example, Code 39 and Interleaved 2 of 5 both use 0 (zero). The last line of the menu prompts you for input.

**Figure 4. Main menu for on-screen programming**

```

***** SNAPSHOT VER X.X MAIN MENU *****

BAR CODE          INPUT EDITING      COMMUNICATIONS
-----
0 CODE39          6 EXTRA FIELDS    C HOST SELECTION
0 I2of5           7 DEFINITION 1    C SERIAL OPTIONS
1 M2of5           8 DEFINITION 2
1 S2of5           9 DEFINITION 3    D DEFAULTS
1 CODE11          A DEFINITION 4    D MORE CONTROLS
2 CODABAR/AMES   A ALLOW QUAL ONLY
2 MSI
2 Code 93
3 UPC-A
3 UPC-E
3 EAN/JAN
4 CODE128        B OTHER CONTROLS
5 LCODE-4/5      5 SYMBOLOGY IDS
USE BACKSPACE TO EXIT MODES
(0-E):

```



To return to the previous menu level, press the **Backspace** key on your keyboard.

#### NOTE

4. Type the I.D. of the category or subcategory you want to display or change, and press **Enter**. For example, enter 3 to display the current parameter settings for UPC-A bar codes. This will also display the parameters and settings for the other subcategories using 3 as an I.D., as shown in Figure 5.  
Notice that the parameters in this list are also identified by numbers and letters. The value following the equals sign (=) in each line is the current setting for that parameter (0 means Off, and 1 means On). The last line is the input prompt.

**Figure 5. On Screen Options for UPC and EAN Bar Codes**

```

UPC-A
0 ENABLE=1
1 TRANSMIT SYSTEM DIGIT=1
2 TRANSMIT CHECKSUM=0
3 CONVERT UPC-A TO EAN-13=0
UPC-E
4 SYSTEM DIGIT 0 ENABLE=1
5 SYSTEM DIGIT 1 ENABLE=1
6 CONVERT UPC-E TO UPC-A=0
7 TRANSMIT SYSTEM DIGIT=0
8 TRANSMIT CHECKSUM=0
EAN/JAN
9 EAN/JAN-8 ENABLE=1
A EAN/JAN-13 ENABLE=1
B CONVERT EAN-13 TO ISBN=0
F TRANSMIT EAN/JAN CHECKSUM=1
EXTENSIONS
C ALLOW 2 DIGIT EXTENSIONS=1
D ALLOW 5 DIGIT EXTENSIONS=0
E REQUIRE EXTENSIONS=0
(0-E):
    
```

5. Type the I.D. of the parameter whose setting you want to change, and press **Enter**. A prompt will display the valid settings for the parameter in parentheses and separated by a “pipe” character (|), as shown in the following example:

ENABLE UPC-A (0|1):

6. Type the setting you want to use, and press **Enter**. The list of options will be redisplayed to verify the change you made.
7. Select another option from the list, or press the **Backspace** key to return to the main menu.



**NOTE**

To leave on-screen programming without saving any changes, type EF at the main-menu prompt and press **Enter**.

8. When you are finished checking or changing parameter settings, type EE at the main-menu prompt and press **Enter**. This will save your changes and exit on-screen programming.

9. If you are working in DOS, press **Ctrl+Z** to return to the DOS prompt.

## Displaying and Printing Current Settings

While you are in on-screen programming mode, you can display the current settings for all the parameters. At the main menu prompt, type E and press **Enter**, and then type D and press **Enter** again. At the next prompt, type 1 and press **Enter**. A list of all the parameters will appear on your screen. To pause the display of the list at any time, press the **Pause** key on your keyboard; then press any key to continue the display.

If you are using a text editor, you can use commands in the editor's menu to print the list of settings or save it to a file. If you are working from the DOS prompt, you can also save or print the list of settings. To print or save the list, follow steps 1 through 9 above, with the following changes in step 2:

- To print the list, use the following command: copy con prn.
- To save the list as a file, use the following command: copy con *filename*, replacing *filename* with the name you want to use for the file.

## Serial Batch Programming

The serial batch method of programming involves creating an ASCII file of programming commands and then transmitting the ASCII file to the scanner. Create the file in DOS or a text editor (Microsoft Notepad, for example), and download it to the computer with a communications program (Procomm or Hyperterminal, for example). The scanner must be connected to a serial port on the host computer, and its serial parameter settings must match the host's settings. The scanner's setting for start-program enable (I.D. #B0) must be either 01 or 03.

Follow these guidelines when creating ASCII files for serial batch programming:

- The first line of the file must begin with \$+\$. This is the scanner's "trigger" to enter programming mode.

- Valid characters for the first character in a line (except the first line) are programming variables or a semicolon.
- A semicolon as the first character in a line indicates the beginning of a comment. A semicolon anywhere else in a string is treated as a normal character. An end-of-line character (CR or CR/LF) marks the end of the comment. (Comments contain information useful to you or anyone else reading the file. They have no effect on the scanner.)
- Data must appear in a line in a specific order: the programming I.D. number for the parameter followed by a value for the parameter setting. If the parameter type is a string, the string characters must be followed by two slashes (//) to terminate the string. (You can use strings as values for preambles, postambles, and extra fields in input editing.)
- You must enter control or “action” characters (for example, tabs, line feeds, or function keys) as a “mnemonic” word enclosed in parentheses (see Full Keyboard Support on page 51). For example, to enter a horizontal tab, you would type (TABR).
- The file must end with EE followed by an end-of-line character (CR or CR/LF) for the programming changes to be saved and the scanner to exit programming mode.

The following is an example of an ASCII file used for serial batch programming:

```
$+$-  
;This is a file example with comments  
;The first line started programming mode  
;Use predefined default D0  
D0  
;Enable Code 39--00 is Code 39 enable/disable,  
; 1 = enable  
001  
;Set Code 39 minimum length (01) TO 4 (04)  
0104  
;Set postamble (B7) to a right tab  
B7(TABR)//  
;Save changes and exit programming mode  
EE
```

The last line of the file is blank, because a carriage return ended the line before it.

The following example would have the same results when used to program the scanner:

```
$$-D00010104B7(TABR)//EE
```

## Serial Programming Parameters

You can use batch programming to set serial parameters for the scanner. This section describes the parameters; bar codes for setting them begin on page 86. (For a complete listing of parameters and defaults, see Programming Options on page 41.)

### Data Type (I.D. #C0)

This parameter determines the data content transmitted to or received from the host. The **ASCII** setting transmits and receives the standard ASCII character set (with the exception of the null character, ASCII 00h, which is received as 80h). The **PC SCAN CODES** setting transmits the press-and-release codes for the keys on a PC keyboard.

### Baud Rate (I.D. #C1)

This parameter determines the communication speed. The setting you use for the scanner must match the setting that the host uses.

### Data Bits (I.D. #C2)

This parameter specifies the number of data bits in each character.

### Parity (I.D. #C3)

This parameter specifies the parity of the data characters.

### Stop Bits (I.D. #C4)

This parameter selects the minimum space between data characters.

## **Xon/Xoff Handshaking (I.D. #C5)**

This parameter is used for software data-flow control. The host can send the Xon character (ASCII 11h) to allow transmission and send the Xoff character (ASCII 13h) to stop transmission.

## **Protocol (I.D. #CA)**

This parameter specifies the format of the data records (groups of data characters) transmitted and received.

In *EOR-only* protocol, a record consists of data characters followed by the end-of-record (EOR) character. (The Xon/Xoff command characters are received with no EOR character appended.) When the protocol parameter is set to 00 (EOR only), the data records are received according to both the EOR-character (I.D. #CC) and timeout (I.D. #CD) settings. Records received with the EOR character appended are processed immediately. If the timeout setting is between 01 and 99 (10 to 990 milliseconds), then the data is processed if either an EOR character is received or a timeout occurs.

In *ACK/NAK* protocol, a record consists of data characters followed by the end-of-record (EOR) character and a check character. This protocol transmits and receives ASCII ACK/NAK (ACK = 06h, NAK = 15h) characters for data integrity control.

A data record must have an EOR character and a check character (mod 256 sum of all data characters and the EOR character) appended to be considered good. (The EOR-character setting, I.D. #CC, cannot be 00.) If the record is good, an ACK character is transmitted to inform the host that the data arrived successfully. If the record is bad, a NAK character is transmitted to the host.

If the NAK character is received or a timeout occurs, the data record is retransmitted. Up to ten attempts will be made. If a communications error occurs, a nine-beep error signal is issued and the scanner is reset.

The interfunction delay setting (I.D. #BE; the default is 00) determines the delay between the receipt of the data record and the transmission of the ACK/NAK response. The length of time the scanner will wait before checking for a valid record after each character is received is determined by the timeout setting. If the timeout setting is between 01 and 99, the delay is between 10 milliseconds and 990 milliseconds; if the timeout setting is 00, the delay is 2.55 seconds.

### **Require Host Response (I.D. #CE)**

Host response records can be either host-controlled indicator records (see below) or serial batch programming records. If this parameter is set to on, the scanner will wait after sending a packet of data, and the host must respond with a host-controlled indicator record before the scanner can continue decoding.

### **Host-Controlled Indicators (I.D. #CF)**

Host-controlled indicator (HCI) data consists of special ASCII records either transmitted to the scanner through the serial communications interface or sent to the system through output redirection (see “” on page 34). Turning this parameter setting to on provides the host with a method to indicate, through the serial port, the status (good or bad) of a read by changing the light-emitting diode (LED), sounding the beeper, or both. You can also use HCI to include delays between LED and beep events, visible laser feedback, and trigger disabling.

Table lists HCI command assignments. All commands are human-readable ASCII characters. An example of a host-controlled indicator command block appears after the table.

**Table 1. Host-Controlled Indicator Commands**

<b>Type</b>	<b>Command</b>	<b>Meaning</b>
Delay (control character <b>D</b> followed by a value from 0 through 254, representing 10-millisecond increments)	D0	No delay
	D1	10-millisecond delay
	D254	2,540-millisecond delay
Beep volume (control character <b>B</b> followed by a value from 0 through 3)	B0	Off
	B1	Low
	B2	Medium
	B3	Loud
Beep tone (control character <b>T</b> followed by a value from 0 through 7)	T0	2400Hz
	T1	2618Hz
	T2	2880Hz
	T3	3200Hz
	T4	3600Hz
	T5	3840Hz
	T6	4114Hz
	T7	4430Hz
LED (control character <b>L</b> followed by a value from 0 through 2)	L0	Off
	L1	Red
	L2	Green
CTRL high/low for pin 10 on 25-pin connector (control character <b>C</b> followed by 0 or 1)	C0	Low
	C1	High

**Table 1. Host-Controlled Indicator Commands (Continued)**

Type	Command	Meaning
Laser feedback ( <b>L</b> eft, <b>M</b> iddle, and <b>R</b> ight segments in bold are visible)*  *A laser feedback command must be followed by a delay command. For example, F5D50 will turn the left and middle laser segments on for 500mS (delay=50×10mS). The scanner will reject a command of F5.	F0	L M R
	F1	L <b>M</b> R
	F2	L <b>M</b> R
	F3	L M R
	F4	L <b>M</b> R
	F5	L <b>M</b> R
	F6	L <b>M</b> R
Trigger enabled/disabled	I0	Enabled
	I1	Disabled

The scanner can receive up to 115 bytes of control data, which can be sent from the host at any time. By default, after a bar code has been read successfully, the red LED on the scanner lights up, the scanner beeps (unless the volume setting is 0), and the data is sent to the host. If the require-host-response parameter is set to on, the scanner will wait for the host to respond with a valid packet of data before reading additional bar code input.

The following example of a host-controlled indicator command block will set the scanner's beeper tone to 3840Hz, turn the beeper on at full volume, turn the green LED on, wait 50 milliseconds, turn the green LED off, wait 50 milliseconds, turn the green LED on again, wait 50 milliseconds, turn the LED off, wait 50 milliseconds, and turn the beeper off:

```
T5B3L2D5L0D5L2D5L0D5B0
```

# NOTES

# Input Editing



Input editing is available only in decoded laser models of the scanner. It is not available in the undecoded models.

## NOTE

The scanner gives you the ability to modify bar code input. This feature is known as *input editing*. With input editing, you program the scanner to change the format of the input data before it sends the data to your computer or terminal.

Table 2 shows just a few of the many uses for input editing.

Input editing overrides standard preamble and postamble settings. Programmed preambles and postambles will be attached only to data input that doesn't qualify for editing (see the next section).

**Table 2. Examples of Input Editing**

By programming the scanner to ...	You can change this ...	To this ...
Delete the first three characters of each string	A0037066 A0037067	37066 37067
Separate the input into two fields separated by a space	A0037066 A0037067	A 0037066 A 0037067 or A003 7066 A003 7067
Separate the input into three fields separated by dashes	A0037066 A0037067	A-003-7066 A-003-7067

**Table 2. Examples of Input Editing (Continued)**

By programming the scanner to ...	You can change this ...	To this ...
Rearrange the order of the fields	A0037066 A0037067	0037066A 0037067A
Separate the input into fields separated by commas and rearrange the order of the fields	A0037066 A0037067	7066,A003 7067,A003
Add text to the data	A0037066 A0037067	Ser. #A0037066 Ser. #A0037067 or A0037066 Jan/95 A0037067 Jan/95

## Creating Qualification Definitions

To qualify for input editing, the data that enters the scanner must meet certain criteria that you define. For example, you may require the data to be Code 39, to have exactly ten numbers or letters, and to end with an X. These criteria make up a *qualification definition*. Any input that meets all the criteria for a definition will be edited according to the parameters that you set for it and output in the format that you specify.

You can create up to four different qualification definitions for input editing. The definitions are numbered 1 through 4, and each definition has its own set of ID numbers for programming parameters (see table 3 beginning on page 30). Parameters for each definition include the following:

- **Symbology** — This specifies whether the data must be of a particular bar code type. Only data of the designated symbology can be considered for qualification. (This parameter can also be set to consider *any* input regardless of symbology.)
- **Record length** — This specifies what length (from 1 through 99 characters) the data must be. Only data of the designated length will be considered. (This parameter can also be set to consider data of *any* length.)
- **Number of input fields** — This specifies into how many fields (from 1 through 8) the input data will be broken down. Each field can then

---

be defined as a specific number of characters (or *any* number of characters) beginning with a specific character (or *any* character).

- **Output sequence** — This specifies the order in which to output the defined fields. The output sequence can also include additional information, such as symbology identifiers, preambles, postambles, or up to 16 extra fields that contain text strings. These extra fields are numbered 0 through 9 and A through F; each field has its own programming ID number. (For more information about output sequencing, see “Understanding Output Sequences ,” beginning on page 32.)

When data is read, the scanner processes the definitions in numerical order. If the input data qualifies under definition 1, the scanner edits and outputs the data; if the data does not qualify under definition 1, the scanner tries definition 2. The process continues in order through all four definitions, and the data is edited according to the first definition under which it qualifies; the other definitions are not used. If the data doesn't qualify under any of the four definitions, then the scanner outputs the data without editing it. If the “allow qualified data only” parameter (ID #AD) is enabled, no data will be output unless it qualifies under one of the definitions.

## Parameters for Input-Editing Definitions

Table 3 lists ID numbers and predefined defaults for parameters for input-editing definitions 1 through 4. You can change your scanner's settings for these parameters using any programming method (see Programming the SnapShot on page 9).

**Table 3. Input Editing Parameters**

Parameter	ID #	Type	Predefined defaults		
			D0	D1	D2
<b>Definition 1</b>			<i>Enter 1 for On and 0 for Off.</i>		
Enable	70	On/Off	Off	On	Off
Symbology (0 = any; for other values, see ID #B5 on page 46)	71	Value	0	C	0
Record length (01–99, or 00 for any)	72	Value	00	00	00
Number of fields (01–08)	73	Value	01	05	01
Fields 1–8 (length followed by qualifier; 00 = any length; (00) = any qualifier)					
Field 1	74	Field	00(00)	00(00)	00(00)
Field 2	75			01!	
Field 3	76			00(00)	
Field 4	77			01=	
Field 5	78			03(00)	
Field 6	79			00(00)	
Field 7	7A			00(00)	
Field 8	7B			00(00)	
Output sequence (see table 4 on page 33)	7C	String	//	*	//
*60610561036201B1// (see “,” beginning on page 32, for explanation)					
<b>Definition 2</b>			<i>Enter 1 for On and 0 for Off.</i>		
Enable	80	On/Off	Off	Off	Off
Symbology (0 = any; for other values, see ID #B5 on page 46)	81	Value	0	0	0
Record length (01–99, or 00 for any)	82	Value	00	00	00
Number of fields (01–08)	83	Value	01	01	01

table continues

**Table 3. Input Editing Parameters (Continued)**

Parameter	ID #	Type	Predefined defaults		
			D0	D1	D2
<i>Fields (length followed by qualifier; 00 = any length; (00) = any qualifier)</i>					
Field 1	84	Field	00(00)	00(00)	00(00)
Field 2	85				
Field 3	86				
Field 4	87				
Field 5	88				
Field 6	89				
Field 7	8A				
Field 8	8B				
Output sequence ( <i>see table 4 on page 33</i> )	8C	String	//	//	//
<b>Definition 3</b>			<b>Enter 1 for On and 0 for Off.</b>		
Enable	90	On/Off	Off	Off	Off
Symbology ( <i>0 = any; for other values, see ID #B5 on page 46</i> )	91	Value	0	0	0
Record length ( <i>01–99, or 00 for any</i> )	92	Value	00	00	00
Number of fields ( <i>01–08</i> )	93	Value	01	01	01
<i>Fields (length followed by qualifier; 00 = any length; (00) = any qualifier)</i>					
Field 1	94	Field	00(00)	00(00)	00(00)
Field 2	95				
Field 3	96				
Field 4	97				
Field 5	98				
Field 6	99				
Field 7	9A				
Field 8	9B				
Output sequence ( <i>see table 4 on page 33</i> )	9C	String	//	//	//

**Table 3. Input Editing Parameters (Continued)**

Parameter	ID #	Type	Predefined defaults		
			D0	D1	D2
<b>Definition 4</b>					
<i>Enter 1 for On and 0 for Off.</i>					
Enable	A0	On/Off	Off	Off	Off
Symbology (0 = any; for other values, see ID #B5 on page 46)	A1	Value	0	0	0
Record length (01–99, or 00 for any)	A2	Value	00	00	00
Number of fields (01–08)	A3	Value	01	01	01
Fields (length followed by qualifier; 00 = any length; (00) = any qualifier)					
Field 1	A4	Field	00(00)	00(00)	00(00)
Field 2	A5				
Field 3	A6				
Field 4	A7				
Field 5	A8				
Field 6	A9				
Field 7	AA				
Field 8	AB				
Output sequence (see table 4 on page 33)	AC	String	//	//	//
Allow qualified data only	AD	On/Off	Off	Off	Off

## Understanding Output Sequences

An output sequence does not contain any text that will actually be output; it contains pointers to fields, which may contain input data or text strings. For example, you cannot include a comma in an output sequence; instead, you must include the output-sequence value of the field containing a comma.

An output sequence can also contain autoterminators, preambles, and postambles. Each field and other type of information is assigned a specific value (either the field number or letter, or the parameter ID number) for inclusion in the output sequence (see table 4).

Each output sequence must end with an end-of-string character (//).

Each input editing definition has its own output sequence with its own ID number. The order of the values in the output sequence determines the order in which the field contents and other information will appear in the output. If a field is not included in the output sequence, its contents will be stripped from the data during input editing.

**Table 4. Output Sequence Settings**

Type of Information	Value Used in Output Sequence	Actual Output
Fields 01–08	01–08	The contents of each specified field
Extra fields	60–6F	The contents of each specified field; see “,” on page 33
Redirection commands	90–96	None; see table , on page 34
Autoterminator	B1	A single ASCII character
Symbology identifier	B5	A code identifying the input form
End-of-string character (//)	Must be used to end each output sequence	

## Using Extra Fields

You can define up to 16 extra fields for input editing. Use the extra fields to include text strings or keyboard actions. For example, by defining one field to contain the word *aisle*, another field to contain the word *bin*, a third field to contain a tab, and another field to contain a space, you can change N21263 to

aisle N21   bin 263



### NOTE

The total number of characters that can be stored in all string commands combined is 120.

You can include the value for each extra field in the output sequence of any or all of the qualification definitions.

Table 5 lists ID numbers and predefined defaults for extra fields. You can change your scanner’s settings for these parameters using the bar code menu, bar code batch, serial batch, or on-screen method of programming.

**Table 5. Extra-Field Parameters**

Parameter	ID #	Type	Predefined defaults		
			D0	D1	D2
Extra field 0	60	String	//	Acc#//	//
Extra field 1	61	String	//	//*	//
Extra field 2	62	String	//	,//†	//
Extra fields 3–16	63–6F <sup>§</sup>	String	//	//	//
<p>*Two spaces                      †A comma followed by a space                      §Extra field 3 = 63    Extra field 8 = 68    Extra field D = 6D                      Extra field 4 = 64    Extra field 9 = 69    Extra field E = 6E                      Extra field 5 = 65    Extra field A = 6A    Extra field F = 6F                      Extra field 6 = 66    Extra field B = 6B                      Extra field 7 = 67    Extra field C = 6C</p>					

## Redirecting Output

After input editing, data is normally output to the host computer or terminal. You can include output-redirectation commands or system commands in the output sequence to redirect the data output (see table ).

**Table 6. Output-Redirectation Settings**

Value Used in Output Sequence	Effect
90	Switches output back to the host after data has been redirected

**Table 6. Output-Redirection Settings**

Value Used in Output Sequence	Effect
91	Redirects data as control commands to be sent to the system's host-controlled indicator (HCI) parser (see page 23)

## An Input Editing Example



### NOTE

To read the bar codes in this example, your scanner must accept Code 39 bar codes with a maximum length of 26 characters. Scan the following bar code to reset your scanner to predefined default D2 and set the maximum length for Code 39 bar codes to 26:



Let's say you are the head of security for a large manufacturing company. Each employee in your company has an identification badge with a Code 39 bar code containing the employee's first name and last name, a five-digit employee number that begins with 0, and sometimes additional information. Names, numbers, and other information in the bar codes are separated by periods, as in the following example:



To enter certain areas of the building, employees must present their badges to a security guard, who scans the bar codes with a scanner attached to a computer terminal. The information output to the computer also includes the location of the security station. The output is in the following format:

```
Last name, First name      Emp. #      Location
```



**Table 7. Parameter Settings for the Example (Continued)**

Parameter	ID #	Value	Meaning
Number of fields	73	07	The incoming data contains seven fields.
Field 1	74	00(00)	The first field can be of any length and can begin with any character.
Field 2	75	01.	The second field is exactly one character long and that character is a period.
Field 3	76	00(00)	The third field can be of any length and can begin with any character.
Field 4	77	02.	The second field is exactly two characters long and the first character is a period.
Field 5	78	04(00)	The fifth field is exactly four characters long and can begin with any character.
Field 6	79	01.	The sixth field is exactly one character long and that character is a period.
Field 7	7A	00(00)	The seventh field can be of any length and can begin with any character.

If you are using the bar code batch programming method and the D2 pre-defined defaults, your bar codes for the definition should look like the following:



Notice that the bar codes do not include settings for record length or for fields 1, 3, and 7. Since these parameters use the defaults, it is not necessary to include them in the bar codes. Also notice the %U in the second bar code. This is the Code 39 equivalent for the null character, which is used in place of 00 in bar code batch programming.

## Step 2: Program Extra Fields

Set parameters for three extra fields to contain the following:

- The security station's location
- A comma and a space to separate the first name from the last name
- A tab to separate columns in the output

Table 8 lists the parameters and data strings you need to use. Each string ends with the end-of-string character (//).

**Table 8  
Parameter Settings  
for the Extra Fields**

**Table 9. Parameter Settings for the Extra Fields**

Parameter	ID #	String	Contents
Extra field 0	60	Area M//	The location of the security station
Extra field 1	61	, //	A comma followed by a space
Extra field 2	62	(TABR)//	A tab character

Your bar codes for the extra-field settings should look like the following:



Notice the use of the plus symbols (+) before the R, the E, and the second A. These cause the letters to be output as lowercase (*a*, *r*, and *e*). In the second bar code, /L is the Code 39 equivalent for a comma, and \$I is the Code 39 equivalent for a tab character. Also notice that each extra-field setting ends with an end-of-string character (//).

## Step 3: Program the Output Sequence

Enter the following codes: 03610162056260B1//

where

**03** is **field 3** (last name)  
**61** is **extra field 1** (comma and space)  
**01** is **field 1** (first name)  
**62** is **extra field 2** (tab)  
**05** is **field 5** (employee number without the leading 0)  
**62** is **extra field 2** (tab)  
**60** is **extra field 0** ("Area M")  
**B1** is the autoterminator (a carriage return)  
**//** is the end-of-string character

Your bar code for the output sequence should look like the following:



The output sequence must be programmed with a single bar code, since you cannot break a string into two bar codes.

#### NOTE

Once you've completed these steps, your scanner should be able to read the bar code on each employee's badge and report that the employee has entered Area M.

# NOTES

# Programming Options

This section contains information about programmable settings for the scanner. You can use the bar codes provided in appendix to program your scanner. You can also use the bar code menu on the last page of this book or another method to program it (see Programming the SnapShot on page 9).

Table 10 lists programming I.D. numbers for predefined defaults.

Table 11 lists display and save-and-exit settings.

Table 12 provides the following information:



## NOTE

For input-editing parameters, see [Input Editing](#) on page 27.

- **Code Parameter** is the “human” name for programming options.
- **I.D. #** is the scanner’s “decoder” name for programming options. For example, if you wanted to set a Code 39 minimum label length, you would enter 01 when programming the scanner. Programming I.D. numbers given in this section can be used with all programming methods.
- **Type** tells what kind of setting to use for each code parameter:
  - On/Off** is a toggle. 1 turns the parameter on, and 0 turns it off.
  - Value** requires a two-character entry (e.g., 02 for two beeps after each good read, or 05 for a length of five).
  - String** uses one or more ASCII characters, followed by // to indicate the end of the string.

—**Immediate** takes effect as soon as the I.D. number is entered.

- **Acceptable Input** gives the settings or range of settings that you can use for each code parameter.
- **Predefined Defaults** tells how the parameter is set when you select predefined default D0, D1, or D2 (see page 9).

Table 13 (on page 49) lists parameter settings for serial communications.

**Table 10. Predefined Defaults**

<b>Setting</b>	<b>I.D. #</b>	<b>Type</b>
Predefined default set 0	D0	Immediate
Predefined default set 1	D1	Immediate
Predefined default set 2	D2	Immediate

**Table 11. Display and Save-and-Exit Settings**

<b>Setting</b>	<b>I.D. #</b>	<b>Type</b>
Display settings (on-screen programming only)	ED	Immediate
Save and exit	EE	Immediate
Exit only, no save	EF	Immediate

**Table 12. General Programming Parameters**

Code Parameter	I.D. #	Type	Acceptable Input	Predefined Defaults		
				D0	D1	D2
<b>Code 39</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	00	On/Off	On or Off	Off	On	On
Minimum length	01	Value	00–50	00	00	00
Maximum length	02	Value	01–50	01	50	20
Enable checksum	03	On/Off	On or Off	Off	Off	Off
Send checksum	04	On/Off	On or Off	Off	Off	Off
Full ASCII mode	05	On/Off	On or Off	Off	On	On
Alternate AIAG checksum	07	On/Off	On or Off	Off	Off	Off
<b>Interleaved 2 of 5</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	08	On/Off	On or Off	Off	On	On
Minimum length	09	Value	02–50	02	02	06
Maximum length	0A	Value	02–50	02	50	10
Enable checksum	0B	On/Off	On or Off	Off	Off	Off
Send checksum	0C	On/Off	On or Off	Off	Off	Off
Use lengths 6 and 14 only	0D	On/Off	On or Off	Off	Off	Off
<b>Matrix 2 of 5</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	10	On/Off	On or Off	Off	On	Off
Minimum length	11	Value	01–50	01	01	06
Maximum length	12	Value	01–50	01	50	10
Enable checksum	13	On/Off	On or Off	Off	Off	Off
Send checksum	14	On/Off	On or Off	Off	Off	Off
<b>Standard 2 of 5</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	15	On/Off	On or Off	Off	On	Off
Minimum length	16	Value	01–50	01	01	06
Maximum length	17	Value	01–50	01	50	10
Enable checksum	18	On/Off	On or Off	Off	Off	Off
Send checksum	19	On/Off	On or Off	Off	Off	Off
Use 2-bar start/stop	1A	On/Off	On or Off	Off	Off	Off

*table continues*

**Table 12. General Programming Parameters (Continued)**

Code Parameter	I.D. #	Type	Acceptable Input	Predefined Defaults		
				D0	D1	D2
<b>Code 11</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	1B	On/Off	On or Off	Off	On	Off
Minimum length	1C	Value	01–50	01	01	04
Maximum length	1D	Value	01–50	01	50	10
Require 2 checksums	1E	On/Off	On or Off	Off	Off	Off
Send checksum(s)	1F	On/Off	On or Off	Off	On	Off
<b>Codabar/Ames</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	20	On/Off	On or Off	Off	On	On
Minimum length	21	Value	01–50	01	01	04
Maximum length	22	Value	01–50	01	50	20
Send start/stop	23	On/Off	On or Off	Off	Off	Off
Codabar-to-CLSI conversion	24	On/Off	On or Off	Off	On	On
<b>Codabar/Ames (continued)</b>				<i>Enter 1 for On and 0 for Off.</i>		
Wide intercharacter gaps allowed	25	On/Off	On or Off	Off	On	Off
Checksum	2F	Value	00 = Disable 01 = Enable 02 = Send	00	00	00
<b>MSI</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	26	On/Off	On or Off	Off	On	Off
Minimum length	27	Value	01–14	01	01	04
Maximum length	28	Value	01–14	01	14	10
Require 2 checksums	29	On/Off	On or Off	Off	Off	Off
2nd checksum Mod 11	2A	On/Off	On or Off	Off	Off	Off
Send checksum(s)	2B	On/Off	On or Off	Off	On	Off
<b>Code 93</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	2C	On/Off	On or Off	Off	On	On
Minimum length	2D	Value	00–50	00	01	02
Maximum length	2E	Value	01–50	00	50	20

*table continues*

**Table 12. General Programming Parameters (Continued)**

Code Parameter	I.D. #	Type	Acceptable Input	Predefined Defaults		
				D0	D1	D2
<b>Universal Product Code-A (UPC-A)</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	30	On/Off	On or Off	Off	On	On
Send system digit	31	On/Off	On or Off	Off	On	On
Send checksum	32	On/Off	On or Off	Off	On	Off
Convert UPC-A to EAN-13	33	On/Off	On or Off	Off	On	Off
<b>Universal Product Code-E (UPC-E)</b>				<i>Enter 1 for On and 0 for Off.</i>		
Use system digit 0	34	On/Off	On or Off	Off	On	On
Use system digit 1	35	On/Off	On or Off	Off	On	On
Convert UPC-E to UPC-A	36	On/Off	On or Off	Off	On	Off
Send system digit	37	On/Off	On or Off	Off	On	Off
Send checksum	38	On/Off	On or Off	Off	On	Off
<b>European Article Numbering (EAN) Japan Article Numbering (JAN)</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable EAN-8/JAN-8	39	On/Off	On or Off	Off	On	On
Enable EAN-13/JAN-13	3A	On/Off	On or Off	Off	On	On
Convert EAN-13 to ISBN	3B	On/Off	On or Off	Off	Off	Off
Send EAN/JAN checksum	3F	On/Off	On or Off	Off	Off	Off
<b>UPC, EAN, JAN Extensions</b>				<i>Enter 1 for On and 0 for Off.</i>		
Allow 2-digit extensions	3C	On/Off	On or Off	Off	On	On
Allow 5-digit extensions	3D	On/Off	On or Off	Off	On	On
Require extensions	3E	On/Off	On or Off	Off	Off	Off
<b>Code 128</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	40	On/Off	On or Off	Off	On	On
Minimum length	41	Value	01–50	01	01	02
Maximum length	42	Value	01–50	01	50	20
Enable UCC128	43	On/Off	On or Off	Off	Off	Off
<b>Labelcode 4/5</b>				<i>Enter 1 for On and 0 for Off.</i>		
Enable	52	On/Off	On or Off	Off	On	Off
Convert	53	On/Off	On or Off	Off	Off	Off

table continues

**Table 12. General Programming Parameters (Continued)**

Code Parameter	I.D. #	Type	Acceptable Input	Predefined Defaults		
				D0	D1	D2
<b>Other Controls</b>				<i>Enter 1 for On and 0 for Off.</i>		
Menu programming mode	B0	Value	00 = Off 01 = Serial batch 02 = Menu 03 = Both	03	03	03
Autoterminator	B1	Value	<i>Any single ASCII character (00 = Off)</i>	(CR)	(CR)	(CR)
ASCII capital to lowercase	B2	On/Off	On or Off	Off	Off	Off
Intercharacter delay	B3	Value	00–99 <i>(milliseconds)</i>	00	00	00
CCD/laser redundancy	B4	On/Off	On or Off	Off	Off	Off
Send assigned symbology identifiers*	B5	On/Off	On or Off	Off	On	Off
*A = UPC-A      D = M 2 of 5      G = EAN-8      J = Code 11      N = Labelcode 4/5 B = I 2 of 5      E = UPC-E      H = MSI      K = Code 128 C = Code 39      F = S 2 of 5      I = Codabar/Ames      M = EAN-13						
Bar code preamble	B6	String	†	//	§	//
Bar code postamble	B7	String	†	//	**	//
†Any supported keyboard keys, up to the maximum length supported by available total memory (about 80 characters) §CODEID // (includes a space after CODEID)						
<b>Other Controls (continued)</b>				<i>Enter 1 for On and 0 for Off.</i>		
Good-read tone	B8	Value	00 = 3600 Hz 01 = 3840 Hz 02 = 4114 Hz 03 = 4430 Hz 04 = 2400 Hz 05 = 2618 Hz 06 = 2880 Hz 07 = 3200 Hz	04	04	04
Good-read number of beeps	B9	Value	01–04	01	01	01
Good-read beep duration	BA	Value	00 = 0.07 sec. 01 = 0.13 sec. 02 = 0.18 sec. 03 = 0.36 sec.	00	00	00

*table continues*

**Table 12. General Programming Parameters (Continued)**

Code Parameter	I.D. #	Type	Acceptable Input	Predefined Defaults		
				D0	D1	D2
End-of-transmission beep	BB	On/Off	On or Off	Off	On	Off
Beeper volume	BC	Value	00 = Off 01 = Low 02 = Medium 03 = High	03	03	03
Interfunction delay	BE	Value	00–99 ( <i>milliseconds</i> )	00	00	00
Use numeric keypad	BF	On/Off	On or Off	Off	Off	Off
Strip Motorola data identifiers	D3	On/Off	On or Off	Off	Off	Off

*table continues*

**Table 12. General Programming Parameters (Continued)**

Code Parameter	I.D. #	Type	Acceptable Input	Predefined Defaults		
				D0	D1	D2
<b>Other Controls (continued)</b>				<i>Enter 1 for On and 0 for Off.</i>		
Trigger modes for wedge mode (not used in wand emulation mode)	D4	Value	00 = Normal 01 = Autoscan 02 = Multiscan	00	00	00
Timing speed for wand emulation mode (C0=03)	D4	Value	00 = 500 $\mu$ S 01 = 300 $\mu$ S 02 = 200 $\mu$ S	00	00	00
Require keyboard	D5	On/Off	On or Off	On	On	On
Autoscan timeout for wedge mode (not used in wand emulation mode)	D6	Value	01–99 ( <i>minutes</i> ) 00 = 256 min.	30	30	30
Idle mode timeout	D6	Value	01–99 ( <i>seconds</i> ) 00 = Off	30	30	30
CTRL out at power-up	D7	On/Off	On = High Off = Low	On	On	On
Host device	C0	Value	*	None	None	None
<p>*00 = IBM PC/XT (<i>international keyboard</i>)  01 = IBM AT, PS/2 30-286, 50, 50Z, 60, 70, 80, 90, 95 (<i>international keyboard</i>)  02 = IBM PS/2 25, 30 (<i>international keyboard</i>)  Note: Settings 00–02 work with DOS only. They transmit the ASCII character set and are not full-keyboard compatible.</p> <p>03 = Wand emulation mode  10 = IBM PC/XT (<i>U.S. keyboard</i>)  11 = IBM AT, PS/2 30-286, 50, 50Z, 60, 70, 80, 90, 95 (<i>U.S. keyboard</i>); ADDS; IDEA 276, 277, 486, 487; I/O CORP 2476; NCR 2900  12 = IBM PS/2 25, 30 (<i>U.S. keyboard</i>)  15 = IBM and Telex terminals (<i>102-key keyboard</i>)  17 = IBM and Telex terminals (<i>122-key keyboard</i>); Decision Data models 3496 and 3781  21 = Macintosh ADB (<i>U.S. keyboard</i>)  25 = Data General D213, D413  32 = TeleVideo  40 = DEC  42 = NEC PowerMate</p> <p>Note: The host devices listed above were supported at the time this user's guide was printed. Additional devices may also be supported. For current information, please contact your dealer or Technical Support (see page 79).</p>						

**Table 13. Serial Parameters**

<b>Code Parameter</b>	<b>I.D. #</b>	<b>Type</b>	<b>Acceptable Input</b>	<b>Predefined Default (C8)</b>
<b>Serial Parameters</b> <i>Enter 1 for On and 0 for Off.</i>				
Data type	C0	Value	50 = ASCII 51 = PC scan codes	50
Baud rate	C1	Value	00 = 300 01 = 600 02 = 1200 03 = 2400 04 = 4800 05 = 9600 06 = 19200 07 = 38400 08 = 57600	05
Data bits	C2	Value	07 = 7 Bits 08 = 8 Bits	08
Parity	C3	Value	00 = None 01 = Mark 02 = Space 03 = Odd 04 = Even	00
Stop bits	C4	Value	01 = 1 Bit 02 = 2 Bits	01
Xon/Xoff handshaking	C5	On/Off	On or Off	Off
Predefined serial defaults	C8			
Protocol	CA	Value	00 = EOR only 01 = ACK/NAK	00
End-of-record (EOR) character	CC	Value	<i>Any single ASCII character</i>	(CR)
<b>Serial Parameters (continued)</b> <i>Enter 1 for On and 0 for Off.</i>				
Timeout	CD	Value	01–99* 00 = 2.55 sec.	03
Require host response (laser models only)	CE	On/Off	On or Off	Off
Use host-controlled indicators (laser models only)	CF	On/Off	On or Off	Off
<i>*10-millisecond increments; the default setting (03) means 30 milliseconds</i>				

# NOTES

# Full Keyboard Support

## About Keyboard Equivalents

Almost every key on your keyboard—including nonprinting keys, such as **PgDn** and **Ctrl**—can be programmed into your scanner. The tables in this section list ASCII values, “mnemonic” values, and Code 39 equivalents for programming all keyboard keys.



### NOTE

Some of the values listed in the ASCII column of the tables (for example, 03 for Caps Lock) are not really ASCII values. They are, however, the values you should use for programming the keys.

Use the ASCII values whenever you program your scanner with the menu method. For example, to turn on the caps lock key (value 03 from table 15) through menu programming, you would scan the bar codes for 0 and 3.

Use the *Code 39* values to create bar codes for batch programming or to include lowercase or nonalphanumeric characters in a bar code. For example, to include an exclamation mark (!) in a bar code, you would encode it as /A (slash capital *a*).



### NOTE

Full ASCII mode for Code 39 must be enabled in the scanner for batch programming.

Use *mnemonics* for on-screen and serial batch programming. For example, to encode the **Enter** key, you would type (CR).



**Be sure to include the parentheses when you enter mnemonics.**

**NOTE**

Some keys act immediately when read into the scanner. For example, the scanner transmits the page-down command to the computer as soon as it reads a bar code containing the characters %U\$Z.

Other keys are not quite so simple. For example, the **Ctrl** key has to be “turned” on and off. When you type **Ctrl+C**, for instance, you hold the **Ctrl** key down while you press **C**, and then you release the **Ctrl** key. Three signals are sent to the host device: **Ctrl** key on (down), **C**, **Ctrl** key off (up). This is the way you need to think when encoding **Ctrl**, **Alt**, **Shift**, and other keys requiring a key to be held down while another is pressed. To include the **Ctrl+C** keystroke combination in a batch bar code, you would encode \$RC\$\$S. For on-screen programming for an IBM PC keyboard, you would need to enter (XC1)C(XC0). The ASCII equivalent for menu programming is 124313.



**The zap character does not eliminate preambles or postambles.**

**NOTE**

Including a function key in a bar code can present a problem if your scanner is programmed to follow every bar code transmission with an autoterminator character. You can eliminate the autoterminator by including the “zap” character, \$Z, in any bar code that you do *not* want followed by the autoterminator. For example, you would encode %U\$A\$Z to send function key **F1** with no autoterminator after it.

Table 14 lists the equivalents for keys that are common to many keyboards. For encoding special keys from a specific keyboard, see the appropriate table from the following list:

Computer or Terminal	Table	Page
ADDS	15	page 55
DEC	18	page 58
Decision Data	19	page 62
IBM PCs and compatibles	15	page 55
IBM terminals	19	page 62
Macintosh	16	page 56
NCR 2900	15	page 55
NEC PowerMate	15	page 55
TeleVideo	17	page 57
Telex	19	page 62

For information about IBM terminals and illustrations of IBM keyboards, see the section beginning on page 59.

**Table 14. Common Keyboard Keys**

Key	Code 39	ASCII Value	Key	Code 39	ASCII Value	Key	Code 39	ASCII Value
SP	space	20	A	A	41	a	+A	61
!	/A	21	B	B	42	b	+B	62
"	/B	22	C	C	43	c	+C	63
#	/C	23	D	D	44	d	+D	64
\$	/D	24	E	E	45	e	+E	65
%	/E	25	F	F	46	f	+F	66
&	/F	26	G	G	47	g	+G	67
'	/G	27	H	H	48	h	+H	68
(*	/H	28	I	I	49	i	+I	69
)†	/I	29	J	J	4A	j	+J	6A
*	/J	2A	K	K	4B	k	+K	6B
+	/K	2B	L	L	4C	l	+L	6C
,	/L	2C	M	M	4D	m	+M	6D
-	- or /M	2D	N	N	4E	n	+N	6E
.	. or /N	2E	O	O	4F	o	+O	6F
/	/O	2F	P	P	50	p	+P	70
0	0 or /P	30	Q	Q	51	q	+Q	71
1	1 or /Q	31	R	R	52	r	+R	72
2	2 or /R	32	S	S	53	s	+S	73
3	3 or /S	33	T	T	54	t	+T	74
4	4 or /T	34	U	U	55	u	+U	75

*table continues*

**Table 14. Common Keyboard Keys (Continued)**

Key	Code 39	ASCII Value	Key	Code 39	ASCII Value	Key	Code 39	ASCII Value
5	5 or /U	35	V	V	56	v	+V	76
6	6 or /V	36	W	W	57	w	+W	77
7	7 or /W	37	X	X	58	x	+X	78
8	8 or /X	38	Y	Y	59	y	+Y	79
9	9 or /Y	39	Z	Z	5A	z	+Z	7A
:	/Z	3A	@	%V	40	`	%W	60
;	%F	3B	[	%K	5B	{	%P	61
<	%G	3C	\	%L	5C		%Q	7C
=	%H	3D	]	%M	5D	}	%R	7D
>	%I	3E	^	%N	5E	~	%S	7E
?	%J	3F	_	%O	5F	Delete	%T	7F
Zap <sup>§</sup>	\$Z	1A						

\*When used as a string value in on-screen programming, must be entered as (( )  
†When used as a string value in on-screen programming, must be entered as ( )  
§Not an actual key; see information about the “zap” character on page 52

**Table 15. IBM (or Compatible) PC and NEC PowerMate Keyboard Keys**

Key	Mnemonic	Code 39	ASCII Value	Key	Mnemonic	Code 39	ASCII Value
F1	(X16)	%U\$A	8001	↑	(UP)	%U%A	801B
F2	(X17)	%U\$B	8002	↓	(DOWN)	%U%B	801C
F3	(X18)	%U\$C	8003	←	(LEFT)	%U%C	801D
F4	(X19)	%U\$D	8004	→	(RIGHT)	%U%D	801E
F5	(X20)	%U\$E	8005	Caps Lock	(X3)	\$C	03
F6	(X21)	%U\$F	8006	Num Lock	(X4)	\$D	04
F7	(X22)	%U\$G	8007	Scroll Lock	(X5)	\$E	05
F8	(X23)	%U\$H	8008	Horizontal Tab	(TABR)	\$I	09
F9	(X24)	%U\$I	8009	Vertical Tab	(X10)	\$K	0B
F10	(X25)	%U\$J	800A	Enter	(CR)	\$M	0D
F11	(X26)	%U\$K	800B	Alt Off	(XA0)	\$N	0E
F12	(X27)	%U\$L	800C	Alt On	(XA1)	\$O	0F
Insert	(X36)	%U\$U	8015	Left Ctrl On	(XC1)	\$S	13
Home	(X37)	%U\$V	8016	Left Ctrl Off	(XC0)	\$R	12
Page Up	(X38)	%U\$W	8017	Right Ctrl On	(X511)	%U\$P	8010
Delete	(X39)	%U\$X	8018	Right Ctrl Off	(X510)	%U\$O	800F
End	(X40)	%U\$Y	8019	Shift Off	(XE0)	\$V	16
Page Down	(X41)	%U\$Z	801A	Shift On	(XE1)	\$W	17
Backspace	(X8)	\$H	08	Esc	(X11)	%A	1B
<b>Numeric Keypad</b>							
Enter	(Enter)	%U%E	801F	3	(NP3)	%U3	8033
	(X52)	%U/J	802A	4	(NP4)	%U4	8034
+	(X53)	%U/K	802B	5	(NP5)	%U5	8035
-	(X55)	%U-	802D	6	(NP6)	%U6	8036
/	(X57)	%U/O	802F	7	(NP7)	%U7	8037
0	(NP0)	%U0	8030	8	(NP8)	%U8	8038
1	(NP1)	%U1	8031	9	(NP9)	%U9	8039
2	(NP2)	%U2	8032				

Table 16. Macintosh Keyboard Keys

Key	Mnemonic	Code 39	ASCII Value	Key	Mnemonic	Code 39	ASCII Value
F1	(X16)	%U\$A	8001	End	(X40)	%U\$Y	8019
F2	(X17)	%U\$B	8002	Page Down	(X41)	%U\$Z	801A
F3	(X18)	%U\$C	8003	↑	(UP)	%U%A	801B
F4	(X19)	%U\$D	8004	↓	(DOWN)	%U%B	801C
F5	(X20)	%U\$E	8005	←	(LEFT)	%U%C	801D
F6	(X21)	%U\$F	8006	→	(RIGHT)	%U%D	801E
F7	(X22)	%U\$G	8007	Tab	(TABR)	\$I	09
F8	(X23)	%U\$H	8008	Return	(CR)	\$M	0D
F9	(X24)	%U\$I	8009	⌘	(XB0)	\$P	10
F10	(X25)	%U\$J	800A	Apple	(XB1)	\$Q	11
F11	(X26)	%U\$K	800B	Control	(XC0)	\$R	12
F12	(X27)	%U\$L	800C	Control	(XC1)	\$S	13
F13	(X28)	%U\$M	800D	Option	(XD0)	\$T	14
F14	(X29)	%U\$N	800E	Option	(XD1)	\$U	15
F15	(X30)	%U\$O	800F	Shift	(XE0)	\$V	16
Help	(X36)	%U\$U	8015	Shift	(XE1)	\$W	17
Home	(X37)	%U\$V	8016	Caps Lock	(XF0)	\$X	18
Page Up	(X38)	%U\$W	8017	Caps Lock	(XF1)	\$Y	19
Delete	(X39)	%U\$X	8018	Esc	(X11)	%A	1B
<b>Numeric Keypad</b>							
Enter	(ENTER)	%U%E	801F	3	(NP3)	%U3	8033
*	(X52)	%U/J	802A	4	(NP4)	%U4	8034
+	(X53)	%U/K	802B	5	(NP5)	%U5	8035
-	(X55)	%U-	802D	6	(NP6)	%U6	8036
/	(X57)	%U/O	802F	7	(NP7)	%U7	8037
0	(NP0)	%U0	8030	8	(NP8)	%U8	8038
1	(NP1)	%U1	8031	9	(NP9)	%U9	8039
2	(NP2)	\$U2	8032				

Table 17. TeleVideo Keyboard Keys

Key	Mnemonic	Code 39	ASCII Value	Key	Mnemonic	Code 39	ASCII Value
F1	(X16)	%U\$A	8001	FUNCT	(XF0)	\$X	18
F2	(X17)	%U\$B	8002	FUNCT	(XF1)	\$Y	19
F3	(X18)	%U\$C	8003	TAB	(TABR)	\$I	09
F4	(X19)	%U\$D	8004	←-TAB	(X10)	\$K	0B
F5	(X20)	%U\$E	8005	Enter	(CR)	\$M	0D
F6	(X21)	%U\$F	8006	ESC	(X11)	%A	1B
F7	(X22)	%U\$G	8007	CHAR INSERT	(X43)	%U/A	8021
F8	(X23)	%U\$H	8008	LINE INSERT	(X44)	%U/B	8022
F9	(X24)	%U\$I	8009	LINE ERASE	(X45)	%U/C	8023
F10	(X25)	%U\$J	800A	NO SCROLL	(X46)	%U/D	8024
F11	(X26)	%U\$K	800B	SEND	(X47)	%U/E	8025
F12	(X27)	%U\$L	800C	CHAR DELETE	(X48)	%U/F	8026
F13	(X28)	%U\$M	800D	LINE DELETE	(X49)	%U/G	8027
F14	(X29)	%U\$N	800E	PAGE ERASE	(X50)	%U/H	8028
F15	(X30)	%U\$O	800F	PAGE	(X51)	%U/I	8029
F16	(X31)	%U\$P	8010	LINE FEED	(X58)	%U/Z	803A
BACKSPACE	(X8)	\$H	08	CLEAR SPACE	(X59)	%U%F	803B
↑	(UP)	%U%A	801B	BREAK	(X60)	%U%G	803C
↓	(DOWN)	%U%B	801C	CE	(X61)	%U%H	803D
←	(LEFT)	%U%C	801D	PRINT	(X62)	%U%i	803E
→	(RIGHT)	%U%D	801E				
<b>Numeric Keypad</b>							
=	(X54)	%U/L	802C	3	(NP3)	%U3	8033
-	(X55)	%U/M	802D	4	(NP4)	%U4	8034
.	(X56)	%U/N	802E	5	(NP5)	%U5	8035
00	(X15)	%U%J	803F	6	(NP6)	%U6	8036
0	(NP0)	%U0	8030	7	(NP7)	%U7	8037
1	(NP1)	%U1	8031	8	(NP8)	%U8	8038
2	(NP2)	\$U2	8032	9	(NP9)	%U9	8039

Table 18. DEC Keyboard Keys

Key	Mnemonic	Code 39	ASCII Values	Key	Mnemonic	Code 39	ASCII Value
F1	(X16)	%U\$A	8001	Prev Screen	(X38)	%U\$W	8017
F2	(X17)	%U\$B	8002	Next Screen	(X41)	%U\$W	801A
F3	(X18)	%U\$C	8003	Lock	(X3)	\$C	03
F4	(X19)	%U\$D	8004	Num Lock	(X4)	\$D	04
F5	(X20)	%U\$E	8005	Scroll Lock	(X5)	\$E	05
F6	(X21)	%U\$F	8006	Backspace	(X8)	\$H	08
F7	(X22)	%U\$G	8007	Tab	(TABR)	\$I	09
F8	(X23)	%U\$H	8008	Enter	(CR)	\$M	0D
F9	(X24)	%U\$I	8009	Esc	(X11)	%A	1B
F10	(X25)	%U\$J	800A	Insert Here	(X36)	%U\$U	8015
F11	(X26)	%U\$K	800B	Remove	(X39)	%U\$X	8018
F12	(X27)	%U\$L	800C	Ctrl Off	(XC0)	\$R	12
F13	(X28)	%U\$M	800D	Ctrl On	(XC1)	\$S	13
F14	(X29)	%U\$N	800E	Shift Off	(XE0)	\$V	16
F15	(X30)	%U\$O	800F	Shift On	(XE1)	\$W	17
F16	(X31)	%U\$P	8010	Help	(X43)	%U/A	8021
F17	(X32)	%U\$Q	8011	Do	(X44)	%U/B	8022
F18	(X33)	%U\$R	8012	Find	(X45)	%U/C	8023
F19	(X34)	%U\$S	8013	PF1	(X46)	%U/D	8024
F20	(X35)	%U\$T	8014	PF2	(X47)	%U/E	8025
↑	(UP)	%U%A	801B	PF3	(X48)	%U/F	8026
↓	(DOWN)	%U%B	801C	PF4	(X49)	%U/G	8027
←	(LEFT)	%U%C	801D	Select	(X50)	%U/H	8028
→	(RIGHT)	%U%D	801E	Compose Character	(X51)	%U/I	8029
<b>Numeric Keypad</b>							
,	(X54)	%U/L	802C	4	(NP4)	%U4	8034
-	(X55)	%U-	802D	5	(NP5)	%U5	8035
.	(X56)	%U/N	802E	6	(NP6)	%U6	8036
0	(NP0)	%U0	8030	7	(NP7)	%U7	8037
1	(NP1)	%U1	8031	8	(NP8)	%U8	8038
2	(NP2)	\$U2	8032	9	(NP9)	\$U9	8039
3	(NP3)	%U3	8033				

# IBM Terminals

Several models of IBM terminals support more than one type of keyboard. Some key definitions depend on the keyboard, while others are the same for all keyboards. Figure 6 and Figure 7 show the layouts of two IBM-terminal keyboards.



## NOTE

**Mnemonic keys (XA)–(XF) are “on/off” keys. For example, to encode an Alt+B keystroke combination, you need to turn Alt on by entering (XA1) before the B and then turn it off afterward with (XA0).**

To encode a key on your keyboard, find the key in the appropriate figure. Keys that are common to both keyboards appear with their normal labels; see table B-1 for the Code 39 and ASCII equivalents for these keys. Keyboard-specific keys in the figures begin with an X (for example, X11) or have a mnemonic label; to encode those keys, see table 19.

Figure 6. IBM 102-key keyboard

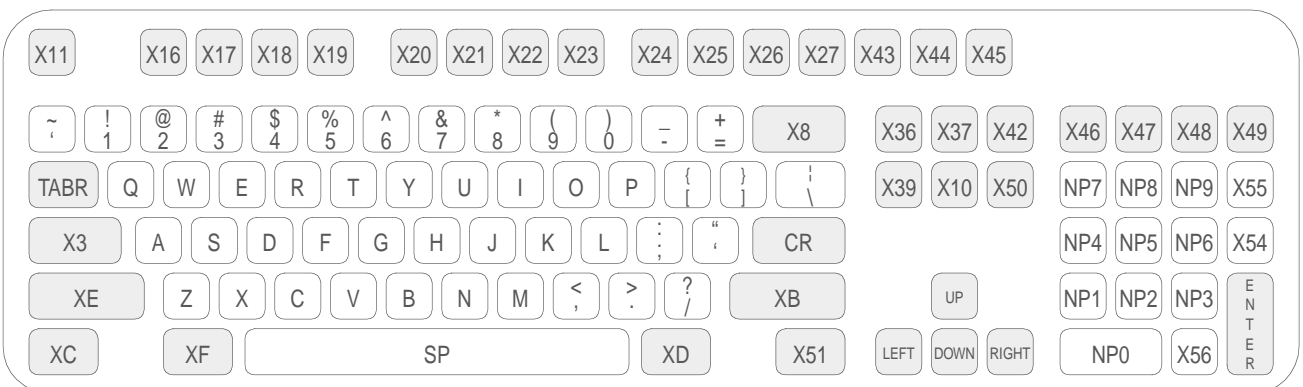
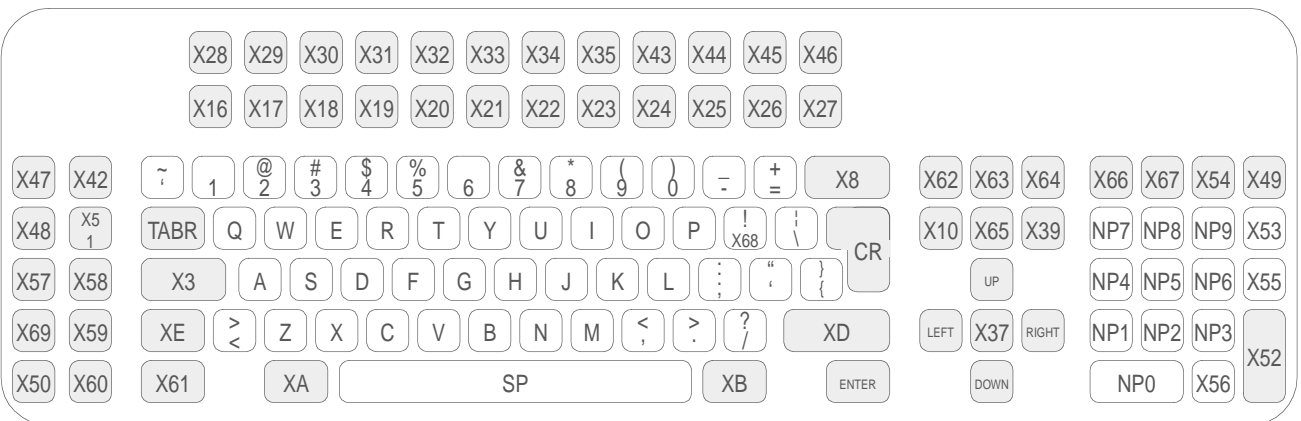


Figure 7. IBM 122-key keyboard



**Table 19. IBM Terminal Keyboard Keys**

Mne- monic	Code 39	ASCII Value	Mne- monic	Code 39	ASCII Value	Mne- monic	Code 39	ASCII Value
(TABR)	\$I	09	(X13)	%C	1D	(X43)	%U/A	8021
(CR)	\$M	0D	(X14)	%D	1E	(X44)	%U/B	8022
(Enter)	%U%E	801F	(X15)	%E	1F	(X45)	%U/C	8023
(UP)	%U%A	801B	(X16)	%U\$A	8001	(X46)	%U/D	8024
(DOWN)	%U%B	801C	(X17)	%U\$B	8002	(X47)	%U/E	8025
(LEFT)	%U%C	801D	(X18)	%U\$C	8003	(X48)	%U/F	8026
(RIGHT)	%U%D	801E	(X19)	%U\$D	8004	(X49)	%U/G	8027
(XAO)	\$N	0E	(X20)	%U\$E	8005	(X50)	%U/H	8028
(XA1)	\$O	0F	(X21)	%U\$F	8006	(X51)	%U/I	8029
(XBO)	\$P	10	(X22)	%U\$G	8007	(X52)	%U/J	802A
(XB1)	\$Q	11	(X23)	%U\$H	8008	(X53)	%U/K	802B
(XC0)	\$R	12	(X24)	%U\$I	8009	(X54)	%U/L	802C
(XC1)	\$S	13	(X25)	%U\$J	800A	(X55)	%U/M	802D
(XD0)	\$T	14	(X26)	%U\$K	800B	(X56)	%U/N	802E
(XD1)	\$U	15	(X27)	%U\$L	800C	(X57)	%U/O	802F
(XE0)	\$V	16	(X28)	%U\$M	800D	(X58)	%U/Z	803A
(XE1)	\$W	17	(X29)	%U\$N	800E	(X59)	%U%F	803B
(XF0)	\$X	18	(X30)	%U\$O	800F	(X60)	%U%G	803C
(XF1)	\$Y	19	(X31)	%U\$P	8010	(X61)	%U%H	803D
(X1)	\$A	01	(X32)	%U\$Q	8011	(X62)	%U%i	803E
(X2)	\$B	02	(X33)	%U\$R	8012	(X63)	%U%j	803F
(X3)	\$C	03	(X34)	%U\$S	8013	(X64)	%U%v	8040
(X4)	\$D	04	(X35)	%U\$T	8014	(X65)	%Ua	8041
(X5)	\$E	05	(X36)	%U\$U	8015	(X66)	%Ub	8042
(X6)	\$F	06	(X37)	%U\$V	8016	(X67)	%Uc	8043
(X7)	\$G	07	(X38)	%U\$W	8017	(X68)	%Ud	8044
(X8)	\$H	08	(X39)	%U\$X	8018	(X69)	%Ue	8045
(X9)	\$J	0A	(X40)	%U\$Y	8019	(X70)	%Uf	8046
(X10)	\$K	0B	(X41)	%U\$Z	801A	(X71)	%Uh	8047
(X11)	%A	1B	(X42)	%U\$P	8020	(X72)	%U\$u	8048
(X12)	%B	1C						

**Table 19. IBM Terminal Keyboard Keys**

Mne- monic	Code 39	ASCII Value	Mne- monic	Code 39	ASCII Value	Mne- monic	Code 39	ASCII Value
<b>Numeric Keypad</b>								
Mne- monic	Code 39		ASCII Value		Mne- monic	Code 39		ASCII Value
(NP0)	%U0 or %U/P		8030		(NP5)	%U5 or %U/U		8035
(NP1)	%U1 or %U/Q		8031		(NP6)	%U6 or %U/V		8036
(NP2)	%U2 or %U/R		8032		(NP7)	%U7 or %U/S		8037
(NP3)	%U3 or %U/S		8033		(NP8)	%U8 or %U/X		8038
(NP4)	%U4 or %U/T		8034		(NP9)	%U9 or %U/Y		8039

# NOTES

# Safety Information, Product Labeling, and Cable Configurations

## FCC Information

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This Class A digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

*Cet appareil numérique de la classe A respecte toute les exigences du Règlement sur le matériel brouilleur du Canada.*

# Product Labeling

Figure 8. Labels providing safety and product-identification information



## Advisory Statement

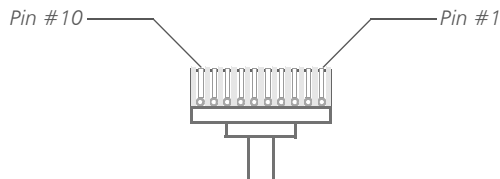


CAUTION

Use of controls, adjustments, or performance of procedures other than those specified herein may result in hazardous visible or invisible laser light exposure.

# Connector Configurations

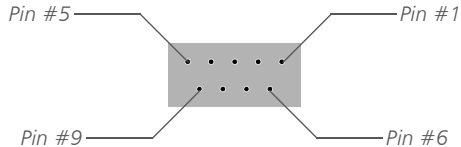
**Figure 9. RJ Connector at End of scanner Cable**



**Table 20. 10-Pin RJ Connector**

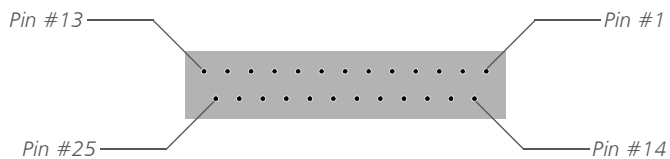
Pin	Function	Direction
1	HSOUT / CTLOUT	Out
2	KB DATA	In/Out
3	CPU CLOCK	In/Out
4	GND	
5	HS IN	In
6	RxD	In
7	KB CLOCK	In/Out
8	+5v	
9	CPU DATA / TAPIN	In/Out
10	TxD / FRKOUT	In/Out

**Figure 10. Female Serial Connector at End of scanner Cable**



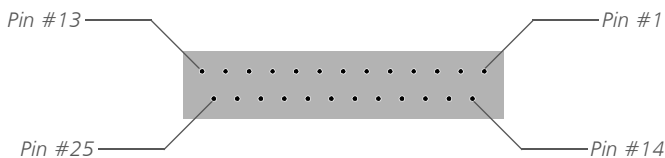
**Table 21. 9-Pin RS-232 Connector**

<b>Pin</b>	<b>Function</b>
2	TxD
3	RxD
5	GND
7	HS IN
8	HS OUT

**Figure 11. Female Serial Connector at End of scanner Cable****Table 22. 25-Pin RS-232 Connector**

<b>Pin</b>	<b>Function</b>
2	RxD
3	TxD
4	HS IN
5	HS OUT
7	GND

**Figure 12. Female Serial Connector at End of Adapter Cable**



**Table 23. 25-Pin Adapter**

Pin	Function
7	KEYBOARD WEDGE INTERFACE
8	KEYBOARD WEDGE INTERFACE
9	KEYBOARD WEDGE INTERFACE
10	KEYBOARD WEDGE INTERFACE
11	SERIAL HS IN
12	KEYBOARD WEDGE INTERFACE
13	KEYBOARD WEDGE INTERFACE
14	GND
19	SERIAL HS OUT
20	SERIAL RxD
21	SERIAL TxD
22	SERIAL TAP IN
23	+ 5 IN
24	+ 12 IN
25	GND

# Programming Bar Codes

This section provides bar codes for common parameter settings for the scanner. Factory default settings (D2) are underlined. If you need to make settings that are not provided in this section, see Programming the SnapShot on page 9 for information.

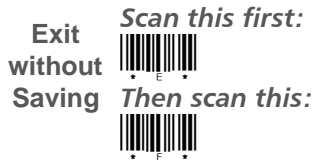
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## Predefined Defaults



## Auto-Learn



## Code 39

### ENABLE



### MINIMUM LENGTH



**MAXIMUM LENGTH**



**ENABLE CHECKSUM**



**SEND CHECKSUM**



**FULL ASCII MODE**



**Interleaved 2 of 5**

**ENABLE**



**MINIMUM LENGTH**



**MAXIMUM LENGTH**



**REQUIRED LENGTH**

*(no default; overrides minimum and maximum settings)*



**ENABLE CHECKSUM**



**SEND CHECKSUM**



**USE LENGTHS 6 AND 14 ONLY** *(case code)*



## Matrix 2 of 5

### ENABLE



### MINIMUM LENGTH



### MAXIMUM LENGTH



### ENABLE CHECKSUM



### SEND CHECKSUM



## Standard 2 of 5

### ENABLE



### MINIMUM LENGTH



### MAXIMUM LENGTH



### ENABLE CHECKSUM



### SEND CHECKSUM



### USE 2-BAR START/STOP



## Code 11

### ENABLE



### MINIMUM LENGTH



### MAXIMUM LENGTH



### REQUIRE 2 CHECKSUMS



### SEND CHECKSUM(S)



## Codabar/Ames

### ENABLE

On



Off



### MINIMUM LENGTH

04



10



20



30



40



50



### MAXIMUM LENGTH

10



20



30



40



50



### SEND STOP/START

On



Off



### CODABAR-TO-CLSI CONVERSION

On



Off



### WIDE INTERCHARACTER GAPS ALLOWED

On



Off



## MSI

### ENABLE

On



Off



### MINIMUM LENGTH

1



4



7



10



12



14



### MAXIMUM LENGTH

1



4



7



10



12



14



### REQUIRE 2 CHECKSUMS

On



Off



### 2ND CHECKSUM MOD 11

On



Off



### SEND CHECKSUM(S)

On



Off



## Code 128

### ENABLE

On



Off



### MINIMUM LENGTH

2



10



20



30



40



50



### MAXIMUM LENGTH

10



20



30



40



50



### ENABLE UCC128

On



Off



## Labelcode 4/5

### ENABLE

On



Off



### CONVERT

On



Off



## UPC-A

### ENABLE UPC-A



### SEND SYSTEM DIGIT



### SEND CHECKSUM



### CONVERT UPC-A TO EAN-13



## UPC-E

### USE SYSTEM DIGIT 0



### USE SYSTEM DIGIT 1



### CONVERT UPC-E TO UPC-A



### SEND SYSTEM DIGIT



### SEND CHECKSUM



## EAN/JAN

### ENABLE EAN-8/JAN-8



### ENABLE EAN-13/JAN-13



### CONVERT EAN-13 TO ISBN



### SEND EAN/JAN CHECKSUM



## UPC/EAN/JAN Extensions

### ALLOW 2-DIGIT EXTENSIONS



### ALLOW 5-DIGIT EXTENSIONS



### REQUIRE EXTENSIONS



## Other Controls

### MENU PROGRAMMING MODE

**Off** 

**Serial batch** 

**Menu** 

**Both** 

### AUTOTERMINATOR

**(CR)** 

**(TAB)** 

**None** 

### ASCII UPPERCASE TO LOWERCASE CONVERSION

**On** 

**Off** 

### INTERCHARACTER DELAY *(in milliseconds)*

**0** 

**5** 

**10** 

**20** 

**40** 

### CCD/LASER REDUNDANCY

**On** 

**Off** 

### SEND SYMBOLOGY IDENTIFIER

**On** 

**Off** 

### GOOD-READ TONE

**2400 Hz** 

**3200 Hz** 

**3600 Hz** 

**4430 Hz** 

**GOOD-READ BEEPS**

1 

2 

3 

4 

**GOOD-READ BEEP DURATION (in seconds)**

0.07 

0.13 

0.18 

0.36 

**END-OF-TRANSMISSION BEEP**

On 

Off 

**BEEPER VOLUME**

Off 

**Low** 

**Medium** 

High 

**INTERFUNCTION DELAY (in milliseconds)**

0 

5 

10 

20 

40 

**USE NUMERIC KEYPAD**

On 

Off 

**TRIGGER MODES**

Normal 

Auto scan 

Multi-scan 

**TIMING SPEED FOR WAND EMULATION**

500  
μS



300 μS



200 μS



**REQUIRE KEYBOARD**

On



Off



**AUTOSCAN TIMEOUT**

1 min.



5 min.



10 min.



30  
min.



60 min.



256  
min.



**IDLE MODE TIMEOUT**

Off



5 sec.



10 sec.



30  
sec.



60 sec.



90 sec.



**CTRL OUT AT POWER-UP**

High



Low



## Host Device

### PC/XT (International keyboard)



**AT; PS/2™ models 30-286, 50, 50Z, 60, 70, 80, 90, and 95 (International keyboard)**



**PS/2 models 25 and 30 (International keyboard)**



**Wand emulation mode**



### PC/XT (U.S. keyboard)



**AT; PS/2 models 30-286, 50, 50Z, 60, 70, 80, 90, and 95 (U.S. keyboard); ADDS; IDEA; I/O CORP; NCR**



**PS/2 models 25 and 30 (U.S. keyboard)**



### IBM and TELEX terminals (102-key keyboard)



### IBM and TELEX terminals (122-key keyboard); Decision Data



### Macintosh™ (U.S. keyboard)



### Data General



### TeleVideo



### DEC



### NEC PowerMate



## Serial Settings

### DATA TYPE

#### ASCII



**PC Scan Codes** 

**BAUD RATE**

**300** 

**600** 

**1200** 

**2400** 

**4800** 

**9600** 

**19200** 

**38400** 

**57600** 

**DATA BITS**

**7** 

**8** 

**PARITY**

**None** 

**Mark** 

**Space** 

**Odd** 

**Even** 

**STOP BITS**

**1** 

**2** 

**XON/XOFF HANDSHAKING**

**On** 

**Off** 

**PROTOCOL**

**EOR Only** 

**ACK/NAK** 

**END-OF-RECORD (EOR) CHARACTER**



**TIMEOUT (in milliseconds)**



**REQUIRE HOST RESPONSE**



**USE HOST-CONTROLLED INDICATORS**



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## X

Xon/Xoff handshaking 22, 49  
bar codes for 87

## Z

“zap” character 52



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# NOTES

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# NOTES

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# NOTES

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# Technical Support

## PSC Website Technical Support

The most comprehensive source for technical support and information for PSC products is the PSC website: [www.pscnet.com](http://www.pscnet.com). The site offers product support, product registration, warranty information, answers to frequently asked questions (product FAQs), product manuals, product tech notes, software updates, patches, demos, and instructions for returning products for repair.

## Reseller Technical Support

Another excellent source for technical assistance and information is an authorized PSC reseller. A reseller is directly acquainted with specific types of businesses, application software, and computer systems and, therefore, is in the best position to provide individualized assistance.

## E-Mail Technical Support

If the solution to a technical support question is not available through the PSC website or a local reseller, contact PSC technical support directly via E-mail at [TechSupport@pscnet.com](mailto:TechSupport@pscnet.com).























## Telephone Technical Support

For those without E-mail access, call toll-free in the USA 1 (800) 547-2507 or (541) 683-5700 from outside the United States of America.

## PSC Solutions Group

For advanced, cost-effective services, contact the PSC Solutions Group (PSG) at (888) 583-3008 or (541) 683-5700 from outside the United States of America, or [psg@pscnet.com](mailto:psg@pscnet.com). You can also visit PSG's webpage, accessible at [www.pscnet.com](http://www.pscnet.com).

# Bar Code Menu

START	 * \$ + \$ - *	OFF	 0	5	 * 5 *
ESC	 * % A *	ON	 1	6	 * 6 *
//	 * / / *	2	 * 2 *	7	 * 7 *
A	 * A *	3	 * 3 *	8	 * 8 *
B	 * B *	4	 * 4 *	9	 * 9 *
C	 * C *	<div style="border: 1px solid black; padding: 10px;"> <p>PREDEFINED DEFAULTS</p> <p><b>DO</b>  * \$ + \$ - D 0 E E *</p> <p><b>D1</b>  * \$ + \$ - D 1 E E *</p> <p><b>D2</b>  * \$ + \$ - D 2 E E *</p> </div>			
D	 * D *				
E	 * E *				
F	 * F *				

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