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# LS 1006


## Product Reference Guide

# LS 1006 Product Reference Guide

**70-33807-01**
**Revision A — September 1998**

Symbol Technologies, Inc. One Symbol Plaza, Holtsville N.Y. 11742

# *LS 1006 Keyboard Wedge Scanner*
# *Product Reference Guide*

*70-33807-01*
*Revision A*
*September 1998*

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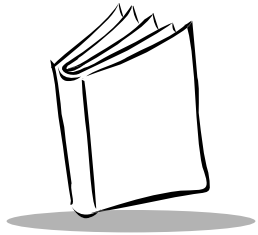

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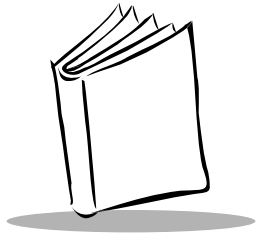
## Appendix A. ASCII Character Set



# About This Guide

The *LS 1006 Product Reference Guide* provides general instructions for setup, programming, operation, troubleshooting, and maintenance of the LS 1006 scanner.

## Notational Conventions

The following conventions are used in this document:

- Bullets (♦) indicate:
  - action items
  - lists of alternatives
  - lists of required steps that are not necessarily sequential
- Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

## Related Publications

- *LS 1000 Series Quick Reference Guide* p/n 70-17422-xx
- *LS 1000 Product Reference Guide* p/n 70-17529-xx
- *LS 1004 Product Reference Guide* p/n 70-33806-xx

# Service Information

If you have a problem with your equipment, contact the Symbol Support Center. Before calling, have the model number, serial number, and several of your bar code symbols at hand.

Call the Support Center from a phone near the scanning equipment so that the service person can try to talk you through your problem. If the equipment is found to be working properly and the problem is symbol readability, the Support Center will request samples of your bar codes for analysis at our plant.

If your problem cannot be solved over the phone, you may need to return your equipment for servicing. If that is necessary, you will be given specific directions.

**Note:** *Symbol Technologies is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty. If the original shipping container was not kept, contact Symbol to have another sent to you.*

## *Symbol Support Centers*

For service information, warranty information or technical assistance contact or call the Symbol Support Center in:

**United States**

Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300
1-800-653-5350

**Canada**

Symbol Technologies Canada, Inc.
2540 Matheson Boulevard East
Mississauga, Ontario, Canada L4W 422
(905) 629-7226

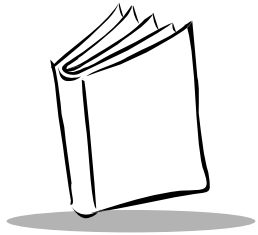
**United Kingdom**

Symbol Technologies International
Symbol Place
Winnersh Triangle, Berkshire RG41 5TP
United Kingdom
0800 3282424(Inside UK)
+44 118 945 7529 (Outside UK)

**Asia/Pacific**

Symbol Technologies Asia, Inc.
230 Victoria Street #04-05
Bugis Junction Office Tower
Singapore 188024
337-6588 (Inside Singapore)
+65-337-6588 (Outside Singapore)

If you purchased your Symbol product from a Symbol Business Partner, contact that Business Partner for service.



# *Chapter 1*
# *Introduction and Setup*

## Chapter Contents

# Introduction

The LS 1006 hand-held laser scanner offers good performance in retail and light industrial applications. The ergonomic design ensures comfortable use for extended periods of time.

The LS 1006 hand-held scanner is based on the Visible Laser Diode (VLD). This state of the art technology gives the scanner a wider decode zone, greater depth of field, and a visible scan beam. This model reads color bar codes and symbols printed on all substrates. See the *LS 1006 Decode Zone* on page 3-4.

The LS 1006 scans automatically at the rate of 36 scans per second. For decode capability, see *Technical Specifications* beginning on page 3-4.

# Audience

The intended audience for this manual is personnel performing the installation/setup and programming of LS 1006 scanners.

# Set-Up

The LS 1006 scanner is a keyboard "wedge" interface which adds efficient, reliable bar code reading to your terminal. Since entered scan data is transmitted as keystrokes, no software changes to the host system are necessary.

## *Unpacking*

Remove the scanner from its packing and inspect it for damage. If the scanner was damaged in transit, call the *Symbol Support Center* at one of the telephone numbers listed in the front of this manual. KEEP THE PACKING. It is the approved shipping container and should be used if you ever need to return your equipment for servicing.

# Connecting Your Scanner

The scanner contains on-board discrete keyboard wedge communications for connecting to asynchronous terminals and host systems. Some installations require one cable; others require additional adapters between the keyboard, the PC, and the Y-cable.

## *Keyboard Wedge Configuration with Y-Cable*

1. Switch off the PC and unplug the keyboard connector.

2. Attach the modular connector of the Y-cable to the scanner port on the scanner.
3. Connect the round male DIN host connector of the Y-cable to the keyboard port on the host device.
4. Connect the round female DIN keyboard connector of the Y-cable to the keyboard.
5. If needed, attach the optional power supply to the conenctor in the middle of the Y-cable.
6. Make sure all connections are secure.
7. Switch on your host system. You are now ready to read bar codes.

During scanning, PC-compatible host terminals should be in CAPS LOCK OFF mode.

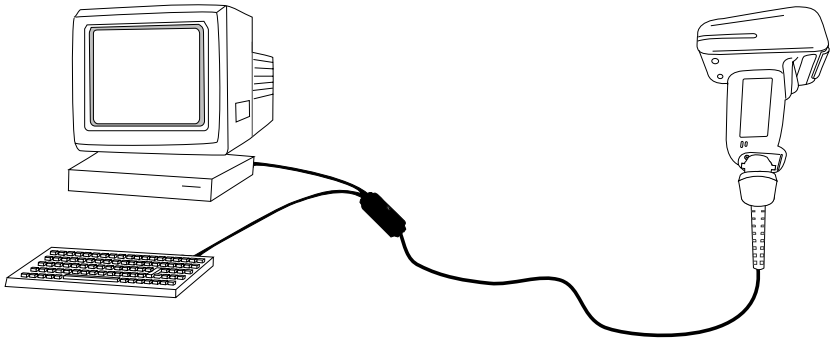
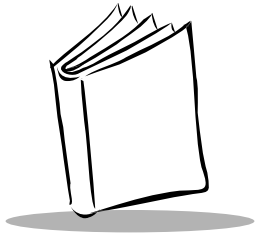


**Figure 1-1. LS 1006 Keyboard Wedge Configuration with Y-Cable**



# *Chapter 2*
# *Scanning*

## Chapter Contents

# Introduction

This chapter covers the techniques involved in scanning bar codes. Included are specific instructions on how to hold the scanner at the appropriate angle to ensure an accurate decode.

# Scanning with the LS 1006

1. Make sure all connections are secure.
2. Aim the scanner away from you and press the trigger. When you press the trigger, the scanning beam is energized for approximately 1 second (default).
3. Make sure the symbol you want to scan is within the scanning range. See the *LS 1006 Decode Zone* diagram on page 3-4.
4. Aim and press the trigger.

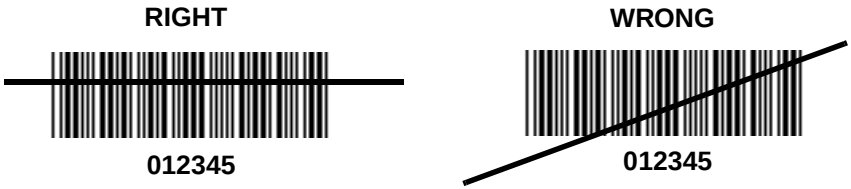
The scanner has read the symbol when:

- You hear a short, high tone beep (if the beeper is enabled).
- The DECODE LED lights.

# Aiming

## Scan the Entire Symbol

- Your scan beam must cross every bar and space on the symbol.
- The larger the symbol, the farther away you should hold the scanner.
- Hold the scanner closer for symbols with bars that are close together.
- A short, high tone beep indicates a good decode.




## Hold at an Angle

Do not hold the scanner directly over the bar code. Laser light reflecting *directly* back into the scanner from the bar code is known as specular reflection. This strong light can "blind" the scanner and make decoding difficult. The area where specular reflection occurs is known as a "dead zone".

You can tilt the scanner up to 65° forward or back and achieve a successful decode. Simple practice quickly shows what tolerances to work within.

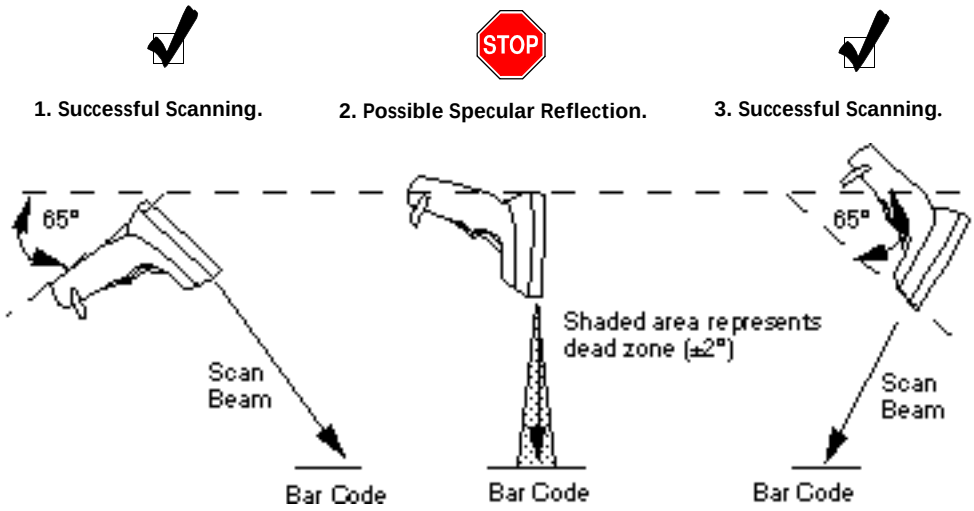
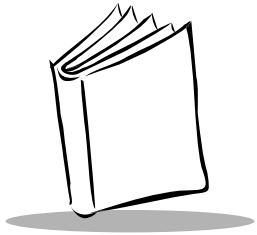



**Figure 2-1. Appropriate Angles for Scanning**



# *Chapter 3*
# *Maintenance & Specifications*

## Chapter Contents

# Introduction

This chapter covers the suggested maintenance of the LS 1006 scanner, as well as the technical specifications, available accessories, pinouts, and beeper definitions.

# Maintenance

Cleaning the exit window is the only maintenance required.

- Do not allow any abrasive material to touch the window.
- Remove any dirt particles with a damp cloth.
- Wipe the window using a damp cloth, and if necessary, a non-ammonia based detergent.
- Do not spray water or other cleaning liquids directly into the window.

## *Cables*

There is one cable available for use with the LS 1006; the PS/2 Keyboard Wedge Cable, part number NA6022.

## *Optional Accessories*

Optional accessories include various stands and holders, which are supplied at extra cost. Additional units of standard accessories may also be purchased at extra cost.

# Troubleshooting

***If the scanner does not operate after you've followed the operating instructions:***

- Be sure the scanner is programmed for the terminal in use.
- Make sure the scanner is programmed to read the type of bar code you are scanning.
- Check for loose cable connections.
- Check the symbol to make sure it is not defaced.
- Try scanning test symbols of the same code type.
- Be sure you are within the proper scanning range.

***If the symbol is decoded, but not transmitted to the host terminal:***

- Be sure the proper host type is selected (See Chapter 4).

***If scanned data is incorrectly displayed on the terminal:***

- Make sure the system is programmed for the correct keyboard type.
- Make sure the CAPS LOCK key is off.
- Be sure the proper host is selected.
- Be sure editing options (e.g., UPC-E to UPC-A Conversion) are properly programmed.

If after performing these checks the symbol still does not scan, contact your distributor or call the Symbol Support Center. See page viii for the telephone number.

# LS 1006 Technical Specifications

## *LS 1006 Decode Zone*

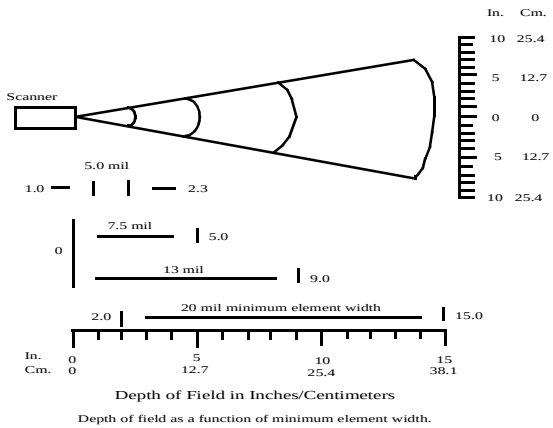



**Figure 3-1. LS 1006 Decode Zone**

**Table 3-1. Technical Specifications**

| Item | Description |
|---|---|
| **Power Requirements*** | 4.75 to 14.5 VDC (max) 100mA @ 5VDC typical |
| **Decode Capability** | The LS 1006 can be programmed to decode the following code types: UPC/EAN, Code 39, Code 39 Full ASCII, Code 93, Codabar, Interleaved 2 of 5, Code 128, EAN 128, and Discrete 2 of 5. Set code length(s) for any linear code type. The LS 1006 can auto-discriminate between all of the above code types except for Code 39 and Code 39 Full ASCII. |
| **Beeper Operation** | User-selectable: Enabled, Disabled, Volume, Tone |
| **Scan Repetition Rate** | 36 (± 3) scans/sec (bidirectional) |
| **Skew Tolerance** | ± 65° from normal |
| **Pitch** | ± 60° from normal |
| **Decode Depth of Field** | See Decode Zone |
| **Print Contrast Minimum** | 25% absolute dark/light differential, measured at 670 nm. |
| **Ambient Light Immunity**<br>**Artificial Lighting**<br>**Sunlight** | <br>450 ft. candles 4844 lux<br>8000 ft. candles 86112 lux |

**Table 3-1. Technical Specifications (Continued)**

| Item | Description |
|---|---|
| **Operating Temperature** | 32° to 104°F0° to 40°C |
| **Storage Temperature** | -40° to 140°F-40° to 60°C |
| **Humidity** | 5% to 95% (non-condensing) |
| **Durability** | 4-ft. drop to concrete1.2 m |
| **Dimensions**<br>**Height**<br>**Length**<br>**Width** | <br>4.8 in.122 mm<br>3.7 in.93 mm<br>2.4 in.60 mm |
| **Laser Classifications** | CDRH Class II<br>IEC 825 Class 2 |
| **Start-Up Time** | <50 msec from scan enable |
| **Data Acquisition Time** | <110 msec from scan enable |
| **Minimum Element Width** | 0.005 in0.127 mm |
| **Maximum Element Width** | 0.020 in5.08 mm |

*For direct host power connection, make sure the host terminal supplies sufficient power for the specified operation. Symbol is not responsible for damage to host equipment or system mis-operation due to an insufficient power condition.

**Table 3-2. Pinouts**

| Pin | LS 1006 | Function |
|---|---|---|
| 1 | Data | Data Line (for synapse) |
| 2 | VBAT | Power Supply |
| 3 | GND | Ground |
| 4 | RTS | Request to Send (for RS-232C) |
| 5 | RXD* | Receive Data Input (for RS-232C) |

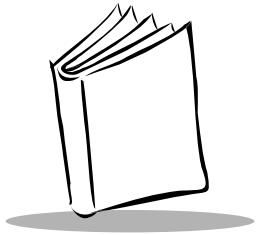
**Table 3-2. Pinouts (Continued)**

| Pin | LS 1006 | Function |
|---|---|---|
| 6 | N.C. | Non-Connected (for RS-232C) |
| 7 | DTR | Data Terminal Ready (for RS-232C) |
| 8 | TXD* | Transmit Data Output (for RS-232C) |
| 9 | CTS | Clear to Send (for RS-232C) |
| 10 | Clock | Clock Line (for Synapse) |

* active low

**Table 3-3. Beeper Indications**

| **Standard Use**<br>**Beeper Sequence** | **Indication** |
|---|---|
| **1 Beep - short high tone** | A bar code symbol was decoded (if decode beeper is enabled). |
| **4 Beeps - long low tone** | A transmission error has been detected in a scanned symbol. The last data scanned was lost. Scan the last data again. |
| **4 Beeps - short high tone** | Low power indication; no further scanning is possible. Change or recharge battery. |
| **3 Beeps - short high tone** | Power-up (continuous power mode only) |
| **Parameter Menu Scanning** | |
| **1 Beep - short high tone** | Appropriate menu within the scanning sequence has been read |
| **1 Beep - warble sound** | Parameter value entered successfully |
| **2 Beeps - long low tone** | Parameter not entered, or incorrect sequence performed. Scan CANCEL and restart the scanning sequence. |



# *Chapter 4*
# *Programming The LS 1006*

## Chapter Contents

# Introduction

This chapter provides information on how to program the LS 1006 scanner. Before programming the scanner, follow the instructions in *Set-Up* on page 1-3.

The Table 4-1 illustrates the default values with which the scanner is shipped. If the default values suit your requirements, scan the **SET ALL DEFAULTS** barcode. This will set the scanner to the default parameters. Changing the scanner's programmable parameters is accomplished by scanning the bar codes provided in this section.

The following table lists the defaults for all parameters. If you wish to change any option, scan the appropriate bar code(s).

**Table 4-1. Default Table**

| Parameter | Default | Page Number |
|---|---|---|
| Set Default Parameter | All Defaults | 4-8 |
| Terminal Selection | IBM PC/AT | 4-8 |
| Country Selection | North America | 4-9 |
| Power On Beep | Enable | 4-10 |
| Beep after Decode | Enable | 4-10 |
| Beeper Tone | Middle | 4-11 |
| Beeper Volume | High Level | 4-11 |
| Decode Attempt Time | 1 second | 4-12 |
| Transmit "No Decode" message | No Message | 4-13 |
| Decode Redundancy | Disable | 4-13 |
| Code Types | All | 4-14 |
| **UPC/EAN** | | |
| Enable/Disable UPC/EAN | Enable | 4-15 |
| Transmit UPC-A Check Digit | Enable | 4-15 |
| Transmit UPC-E Check Digit | Enable | 4-15 |
| Decode UPC Only | Disable | 4-15 |

**Table 4-1. Default Table (Continued)**

| Parameter | Default | Page Number |
|---|---|---|
| Transmit EAN 13/EAN 8 Check Digit | Enable | 4-16 |
| Transmit Bookland EAN Check Digit | Enable | 4-16 |
| Convert UPC-E to UPC-A | Disable | 4-17 |
| EAN Zero Extend | Disable | 4-17 |
| Enable/Disable Bookland EAN | Disable | 4-17 |
| Enable/Disable UPC/EAN Coupon Code | Disable | 4-18 |
| Decode UPC/EAN Supplemental | No Supplemental | 4-19 |
| UPC-E Preamble | System Character | 4-20 |
| UPC-A Preamble | System Character | 4-20 |
| UPC/EAN Security Level | Level 0 | 4-21 |
| **Code 128** | | |
| Enable/Disable Code 128 | Enable | 4-22 |
| Enable/Disable UCC/EAN 128 | Enable | 4-22 |
| **Code 39** | | |
| Enable/Disable Code 39 | Enable | 4-22 |
| Code 39 modulo 43 check | Disable | 4-25 |
| Transmit Code 39 Check Digit | Disable | 4-25 |
| Enable/Disable Code 39 Full ASCII | Enable | 4-25 |
| Enable/Disable Trioptic Code 39 | Disable | 4-25 |
| **Code32** | | |
| **Enable/Disable Code32** | Disable | 4-26 |
| **Code32 Prefix A** | Disable | 4-26 |
| **Code 93** | | |
| Enable/Disable Code 93 | Enable | 4-27 |
| **I 2 of 5** | | |
| Enable/Disable Code I 2 of 5 | Enable | 4-29 |

**Table 4-1. Default Table (Continued)**

| Parameter | Default | Page Number |
|---|---|---|
| Set I 2 of 5 Lengths | 14 (length 1)<br>0 (length 2) | 4-29 |
| Modulo 10 Check Digit | Disable | 4-31 |
| Transmit I 2 of 5 Check Digit | Enabled | 4-31 |
| ITF14/EAN13 Conversion | Disable | 4-31 |
| **D 2 of 5** | | |
| Enable/Disable Code D 2 of 5 | Enable | 4-32 |
| Modulo 10 Check Digit | Disable | 4-32 |
| Set D 2 of 5 Lengths | 12 (length 1)<br>0 (length 2) | 4-32 |
| **Codabar** | | |
| Enable/Disable Codabar | Enable | 4-35 |
| Set Lengths for Codabar | Any Length | 4-35 |
| CLSI Editing | Disable | 4-37 |
| NOTIS Editing | Disable | 4-37 |
| **MSI Plessey** | | |
| Enable/Disable MSI Plessey | Disable | 4-37 |
| Set Lengths for MSI Plessey | Any Length | 4-37 |
| MSI Plessey Check Digits | One | 4-40 |
| Transmit MSI Plessey Check Digits | Disable | 4-40 |
| MSI Plessey Check Digit Algorithm | MOD 10/MOD 10 | 4-40 |
| **Data Options** | | |
| Transmit Code ID Character | Disable | 4-41 |
| Prefix | None | 4-42 |
| Suffix | CR/LF | 4-42 |

**Table 4-1. Default Table (Continued)**

| Parameter | Default | Page Number |
|---|---|---|
| Data Transmission Format | <PREFIX><DATA><br><SUFFIX1><SUFFIX2> | 4-44 |
| Caps Lock Scan Data | Caps Lock Off | 4-44 |
| Ignore Unknown Character | Send Bar codes with unknown characters | 4-45 |
| Intercharacter Delay | 0 msec. | 4-45 |
| Interpacket Delay | 0 sec. | 4-47 |

# Scanning Sequence

A scanning sequence establishes a value for one parameter type. During a scanning sequence, bar codes are scanned to select a parameter. All bar codes necessary for programming the scanner are provided in *Parameter Menus*, beginning on page 4-8.

## *Scanning Sequence Example*

In this example, assume you want to program the scanner for all default settings except for two parameters, DECODE UPC ONLY and INTERCHARACTER DELAY.

Since you want to keep the majority of the default settings, scan the SET ALL DEFAULTS bar code. The default for DECODE UPC ONLY is DISABLED, but in this example, you need it enabled. To do this, scan the DECODE UPC ONLY ENABLE bar code. You'll hear hi/lo/hi/low warble. The warble sound indicates that the scanner has been successfully programmed for the selected parameter. Other beeper indications are listed in Chapter 3.

The default for INTERCHARACTER DELAY is 0 msec, but you need it set to 2 msec. To program the scanner for a 2msec intercharacter delay, scan the bar codes listed below. This sequence includes a two-digit entry; single-digit entries require a leading zero.

| | You'll hear... |
|---|---|
| 1. Scan INTERCHARACTER DELAY | Short high tone |
| 2. Scan 0 | Short high tone |
| 3. Scan 2 | Hi/Lo/Hi/Lo warble |

## Errors While Scanning

Don't worry if you make an error during a scanning sequence. If you're scanning a multi-step sequence, scanning CANCEL removes you from that sequence so that you can start again.

Otherwise, simply scan the single correct bar code for the desired parameter.

# Parameter Menus

Refer to the Default table in the front of this chapter for the default settings for each parameter type.

## *Set Parameter Defaults*

Scanning the SET ALL DEFAULTS bar code returns all parameters to the default values listed in the Default Table.

**Set All Defaults**

## *Terminal Selection*

Scan the appropriate bar code associated with your terminal type.

**IBM PC/AT IBM PS/2-50, 55SX, 60, 70, 80**

**IBM PC/XT**

**IBM PS/2-30**

## *Terminal Selection (cont'd)*

**NCR 7052**

**No Host**

## *Country Selection*

Scan the appropriate bar code for your country.

**North American**

**German**

**French**

**Italian**

**French International**

**Swedish**

**Spanish**

**British**

## Country Selection (cont'd)

**Japanese**

## Power On Beep Enable/Disable

This option, if selected, causes the beeper to sound at power-up (in continuous power mode only).

**Power On Beep Enable**

**Power On Beep Disable**

## Beep after Decode

This option determines whether the beeper sounds during normal scanning. Usually, it is desirable to operate the unit with the beeper enabled. In all cases, the beeper operates during parameter menu scanning and indicates error conditions. See Table 3-3 on page 3-7.

**Beeper Enable**

**Beeper Disable**

## *Beeper Tone*

Three options are available for beeper tone (frequency); low, middle, and high.

**Beeper Tone Low**

**Beeper Tone Middle**

**Beeper Tone High**

## *Beeper Volume*

Three options are available for beeper volume; low, middle, and high.

**Beeper Volume Low**

**Beeper Volume Middle**

**Beeper Volume High**

## Decode Attempt Time

This parameter sets the length of time the scanner laser beam remains on while attempting to scan a symbol.

**0.5 seconds**

**1.0 seconds**

**1.5 seconds**

**2.0 seconds**

**2.5 seconds**

**3.0 seconds**

**3.5 seconds**

**4.0 seconds**

**4.5 seconds**

**5.0 seconds**

**5.5 seconds**

**6.0 seconds**

## *Decode Attempt Time (cont'd)*

**6.5 seconds**

**7.0 seconds**

## *Transmit "No Decode" Message*

This feature gives you the option to transmit "NR" when a symbol does not decode. Prefixes and suffixes enabled will be appended around this character.

**Transmit "NO DECODE" Message**

**Do Not Transmit "NO DECODE" Message**

## *Decode Redundancy*

When you select ENABLE CODABAR DECODE REDUNDANCY, a Codabar symbol must be decoded in both directions before being accepted as a successful decode. If you select ENABLE ALL CODE TYPES DECODE REDUNDANCY, all bar code symbols must be decoded in both directions before being accepted as successful decodes.

**Enable CODABAR Decode Redundancy**

**Enable ALL CODE TYPES Decode Redundancy**

**Disable CODABAR Decode Redundancy**

**Disable ALL CODE TYPES Decode Redundancy**

## Code Types

Selecting the ENABLE ALL CODE TYPES bar code below enables the following symbologies:

- UPC Versions A and E (EAN 8 and 13)
- Code 39
- Interleaved 2 of 5
- Code 93
- Code 128
- UCC/EAN128

The scanner autodiscriminates between all of the above symbologies.

**Enable All Code Types**

**Disable All Code Types**

## *UPC/EAN*

### Enable/Disable UPC/EAN

**Enable UPC/EAN**

**Disable UPC/EAN**

### Transmit UPC-E/UPC-A

Select this option if decoded UPC-E or UPC-A symbols are transmitted with or without the check digit.

**Transmit UPC-A check digit**

**Do Not Transmit UPC-A Check Digit**

**Transmit UPC-E check digit**

**Do Not Transmit UPC-E Check Digit**

### Decode UPC Only (Not EAN)

If selected, this option limits the scanner's capability to UPC versions only. It disables EAN decode capability.

**Decode UPC Only Enable**

**Decode UPC Only Disable**

## Transmit EAN13/EAN8 Check Digit

This option determines whether decoded EAN 13 or EAN 8 symbols are transmitted with or without the check digit.

**Transmit EAN 13 Check Digit**

**Do Not Transmit EAN 13 Check Digit**

**Transmit EAN 8 Check Digit**

**Do Not Transmit EAN 8 Check Digit**

## Transmit Bookland EAN Check Digit

This option determines whether decoded Bookland EAN symbols are transmitted with or without the check digit.

**Transmit Bookland EAN Check Digit**

**Do Not Transmit Bookland EAN Check Digit**

## Convert UPC-E to UPC-A

Select this option to convert UPC-E (zero suppressed) decode data to UPC-A format before transmission. After conversion, data follows UPC-A format and is affected by UPC-A programming selections (e.g., Preamble, Check Digit).

**Convert UPC-E to UPC-A**

**Do Not Convert UPC-E to UPC-A**

## EAN Zero Extend

This parameter adds five leading zeros to decoded EAN-8 symbols to make them compatible in format to EAN-13 symbols.

**Enable EAN Zero Extend**

**Disable EAN Zero Extend**

## Enable/Disable Bookland EAN

**Enable Bookland EAN**

**Disable Bookland EAN**

## Enable/Disable UPC/EAN Coupon Code

**Enable UPC/EAN Coupon Code**

**Disable UPC/EAN Coupon Code**

## Decode UPC/EAN Supplemental

This option is used to select whether UPC/EAN is decoded with or without supplemental characters, or whether the unit autodiscriminates between the two. Supplementals are additionally appended characters, according to specific code format conventions (e.g., UPC A+2, UPC E+2, EAN 8+5).

If UPC/EAN Supplementals is selected, UPC/EAN symbols without supplemental characters won't be decoded. If Ignore UPC/EAN Supplementals is selected and the scanner is presented with a UPC/EAN plus supplemental symbol, the UPC/EAN is decoded and the supplemental characters are ignored. If autodiscrimination is chosen, the scanner will, after additional processing to ensure a good decode, transmit either.

**Decode UPC/EAN Supplementals**

**Ignore UPC/EAN Supplementals**

**Autodiscriminate UPC/ EAN Supplementals**

## UPC A and E Preamble(s)

Three options are available for the lead-in characters for decoded UPC-A or UPC-E symbols transmitted to the host device. Select one preamble for UPC-A decodes and one for UPC-E decodes. These lead-in characters are considered part of the symbol itself. The three options are:

- a system character only
- the country code and system character
- no preamble

The system character is the digit printed to the extreme left of a UPC symbol. The country code for UPC is always zero, and it cannot be transmitted without the system character.

**UPC-A Preambles**

**None**

**System Character**

**System Character and Country Code**

**UPC-E Preambles**

**None**

**System Character**

**System Character and Country Code**

## UPC/EAN Security Level

The scanner offers four levels of decode security for UPC/EAN bar codes. Increasing levels of security are provided for decreasing levels of bar code quality. There is an inverse relationship between security and scanner aggressiveness, so be sure to choose only that level of security necessary for any given application.

Security Level 0 - This is the default setting which allows the scanner to operate in its most aggressive state, while providing sufficient security in decoding in spec UPC/EAN bar codes.

Security Level 1 - As bar code quality levels diminish, certain characters become prone to mis-decodes before others (i.e., 1, 2, 7, 8). If you are experiencing mis-decodes of poorly printed bar codes, and the mis-decodes are limited to these characters, select this security level.

Security Level 2 - If you are experiencing mis-decodes on poorly printed bar codes, and the mis-decodes are not limited to characters 1, 2, 7 and 8, select this security level.

**UPC/EAN Security Level 0**

**UPC/EAN Security Level 1**

**UPC/EAN Security Level 2**

# *Code 128*

## Enable/Disable Code 128

**Enable Code 128**

**Disable Code 128**

## Add/Disable UCC/EAN 128

**Enable UCC/EAN 128**

**Disable UCC/EAN 128**

# *Code 39*

## Enable/Disable Code 39

**Enable Code 39**

**Disable Code 39**

## Set Lengths for Code 39

Select one or two lengths for Code 39. If you set both length 1 and length 2 to 0, the scanner can read any length within 45 characters. We recommend that you set Code 39 modulo 43 check to enabled when you set both length 1 and length 2 to 0. If any default setting is in effect and is an appropriate length, it need not be reset. Length 1 may range from 00-45 and length 2 may range from 00-45.

**Code 39 Length 1**

**Code 39 Length 2**

## Within Range for Code 39

This option allows you to decode a code type within a specified range. Set MIN Length and MAX Lengths for Code 39. For example, to decode Code 39 symbols containing between 4 and 12 characters, set MIN Length to 04 and MAX Length to 12. If you set both MIN and MAX Length to 0, the scanner can read any length within 45 characters. We recommend that you set the Code 39 modulo 43 check to enabled when you set both Length 1 and Length 2 to 0. If any default setting is in effect and is an appropriate length, it need not be reset. Length 1 may range from 00-45 and Length 2 may range from 00-45.

**Code 39 MIN Length**

**Code 39 MAX Length**

## Fixed Lengths and Lengths Within Range for Code 39

**0**

**1**

**2**

**3**

**4**

**5**

**6**

**7**

**8**

**9**

**Cancel**

## Code 39 Modulo 43 Check

When enabled, this parameter checks the integrity of a Code 39 symbol to ensure it complies with specified algorithms.

**Verify Code 39 Check Digit**

**Do Not Verify Code 39 Check Digit**

## Transmit Code 39 Check Digit

When enabled, Code 39 Check Digit will be sent to the host.

**Transmit Code 39 Check Digit Enable**

**Transmit Code 39 Check Digit Disable**

## Enable/Disable Code 39 Full ASCII

**Enable Code 39 Full ASCII**

**Disable Code 39 Full ASCII**

## Enable/Disable Trioptic Code39

**Enable Trioptic Code39**

**Disable Trioptic Code39**

# *Code32*

## Enable/Disable Code32

**Enable Code32**

**Disable Code32**

## Code32 Prefix A

**Enable Code32 Prefix**

**Disable Code32 Prefix**

# *Code 93*

## Enable/Disable Code 93

**Enable Code 93**

**Disable Code 93**

## Set Lengths for Code 93

Select one or two lengths for Code 93. If you set both Length 1 and 2 to 0, the scanner reads any length within 55 characters. If any default setting is in effect and is an appropriate length, it need not be reset. Both Length 1 and Length 2 may range from 00-55.

**Code 93 Length 1**

**Code 93 Length 2**

## Within Range for Code 93

This option allows you to decode a code type within a specified range. Set MIN Length and MAX lengths for Code 93. For example, to decode Code 93 symbols containing between 4 and 12 characters, set MIN Length to 04 and MAX to 12. If you set both MIN Length and MAX Length to 0, the scanner can read any length within 55 characters. If any default setting is in effect and is an appropriate length, it need not be reset. Length 1 and Length 2 may range from 00-55.

**Code 93 MIN Length**

**Code 93 MAX Length**

## Fixed Lengths and Within Range for Code 93

**0**

**1**

**2**

**3**

**4**

**5**

**6**

**7**

**8**

**9**

**Cancel**

## *Interleaved 2 of 5*

### Enable/Disable Code I 2 of 5

**Enable Code I 2 of 5**

**Disable Code I 2 of 5**

### Fixed Lengths for Code I 2 of 5

Select one or two lengths for the Interleaved 2 of 5 codes. If you set both Length 1 and Length 2 to 0, the scanner can read any length within 36 characters. It is recommended that you set the I 2 of 5 modulus 10 check to enabled when you set both Length 1 and Length 2 to 0.

If any default setting is in effect and is an appropriate length, it need not be reset. Length 1 may range from 00-36 and Length 2 may range from 00-36.

**I 2 of 5 Length 1**
**(Range 00-36)**

**I 2 OF 5 Length 2**
**(Range 00-36)**

### Within Range for Code I 2 of 5

This option allows you to decode a code type within a specified range. Set MIN Length and MAX Lengths for the Interleaved 2 of 5 codes. For example, to decode I 2 of 5 symbols containing between 4 and 12 characters, set MIN Length to 04 and MAX Length to 12. If you set both MIN Length and MAX Length to 0, the scanner can read any length within 55 characters. We recommend that you set the I 2 of 5 modulus 10 check to enabled when you set both Length 1 and 2 to 0. If any default setting is in effect and is an appropriate length, it need not be reset. Both Length 1 and Length 2 may range from 00-55.

**I 2 of 5 MIN Length**

**I 2 of 5 MAX Length**

## Fixed Lengths and Within Range for Code I 2 of 5

0

1

2

3

4

5

6

7

8

9

Cancel

## I 2 of 5 Modulo 10 Check

When enabled, this parameter checks the integrity of an Interleaved 2 of 5 symbol to ensure it complies with specific algorithms.

**I 2of 5 Modulo 10 Check Digit Enable**

**I 2of 5 Modulo 10 Check Digit Disable**

## Transmit I 2 of 5 Check Digit

When enabled, I 2 of 5 Check Digit is sent to the host.

**Enable Transmit Code I 2 of 5 Check Digit**

**Disable Transmit Code I 2 of 5 Check Digit**

## ITF-14/EAN-13 Conversion

This feature converts a 14-character I 2 of 5 code into EAN-13, and transmits to the host as EAN-13. In order to accomplish this, the I 2 of 5 code must be enabled, one length (either LENGTH 1 or LENGTH 2) must be set to 14, the code must have a leading zero and proper trailing check digit.

**ITF-14/EAN-13 Conversion Enable**

**ITF-14/EAN-13 Conversion Disable**

# *Discrete 2 of 5*

## Enable/Disable D 2 of 5

**Enable Code D 2 of 5**

**Disable Code D 2 of**

## D 2 of 5 Modulo 10 Check

When enabled, this parameter checks the integrity of a Discrete 2 of 5 symbol to ensure it complies with specific algorithms.

**D 2 of 5 Modulo 10 Check Digit Enable**

**D 2 of 5 Modulo 10 Check Digit Disable**

## Transmit D 2 of 5 Check Digit

When enabled, the D 2 of 5 Check Digit is sent to the host.

**Transmit D 2 of 5 Check Digit**

**Do Not Transmit D 2 of 5 Check Digit**

## Fixed Lengths for Code D 2 of 5

Select one or two lengths for the Discrete 2 of 5 codes. If you set the both of them (Length 1 and Length 2) to 0, the scanner can read any length within 36 characters. It is recommended that you set the D 2 of 5 modulus 10 check to enabled when you set both Length 1 and Length 2 to 0.

If any default setting is in effect and is an appropriate length, it need not be reset. Length 1 may range from 00-36 and Length 2 may range from 00-36

**D 2 of 5 Length 1**
**(Range 00-36)**

**D 2 OF 5 Length 2**
**(Range 00-36)**

## Within Range for Code D 2 of 5

This option allows you to decode a code type within a specified range. Set MIN Length and MAX Lengths for the Discrete 2 of 5 codes. For example, to decode D 2 of 5 symbols containing between 4 and 12 characters, set MIN Length to 04 and MAX Length to 12. If you set both MIN Length and MAX Length to 0, the scanner can read any length within 45 characters. We recommend that you set the I 2 of 5 modulus 10 check to enabled when you set both Length 1 and 2 to 0. If any default setting is in effect and is an appropriate length, it need not be reset. Both Length 1 and Length 2 may range from 00-45.

**D 2 of 5 MIN Length**

**D 2 of 5 MAX Length**

## Fixed Lengths for Code 2 of 5 (cont'd)

0

1

2

3

4

5

6

7

8

9

CANCEL

# *Codabar*

## Enable/Disable Codabar

**Enable Codabar**

**Disable Codabar**

## Fixed Lengths for Codabar

Select one or two lengths for Codabar. If set both Lengths 1 and 2 to 0, the scanner can read any length within 55 characters. If any default setting is in effect and is an appropriate length, it need not be reset. Length 1 may range from 00-55, and Length 2 may range from 00-55.

**Codabar Length 1**

**Codabar Length 2**

## Within Range for Codabar

This option allows you to decode a code type within a specified range. Set MIN Length and MAX Lengths for Codabar. For example, to decode Codabar symbols containing between 4 and 12 characters, set MIN Length to 04 and MAX Length to 12. If you set both MIN Length and MAX Length to 0, the scanner can read any length within 55 characters. We recommend that you set the I 2 of 5 modulus 10 check to enabled when you set both Length 1 and 2 to 0. If any default setting is in effect and is an appropriate length, it need not be reset. Both Length 1 and Length 2 may range from 00-55.

**Codabar MIN Length**

**Codabar MAX Length**

## Fixed Lengths and Within Range for Codabar

0

1

2

3

4

5

6

7

8

9

CANCEL

### CLSI Editing

Use this parameter to insert a space after the 1st, 5th, and 10th characters of a 14-character Codabar symbol. This symbol length includes start and stop characters.

**Enable CLSI Editing**

**Disable CLSI Editing**

### NOTIS Editing

This option strips the start and stop characters from decoded Codabar symbols.

**Enable NOTIS Editing**

**Disable NOTIS Editing**

## *MSI Plessey*

### Enable/Disable MSI Plessey

**Enable MSI Plessey**

**Disable MSI Plessey**

### Within Range for MSI Plessey

This option allows you to decode a code type within a specified range. Set MIN Length and MAX Lengths for MSI Plessey. For example, to decode MSI Plessey symbols containing between 4 and 12 characters, set MIN Length to 04 and MAX Length to 12. If you set both MIN Length and MAX Length to 0, the scanner can read any length within 55 characters. We recommend that you set the I 2 of 5 modulus 10 check to enabled when you set both

Length 1 and 2 to 0. If any default setting is in effect and is an appropriate length, it need not be reset. Both Length 1 and Length 2 may range from 00-55.

**MSI Plessey MIN Length**

**MSI Plessey MAX Length**

## Fixed Lengths and Within Range for MSI Plessey

**0**

**1**

**2**

**3**

**4**

**5**

**6**

**7**

**8**

**9**

**CANCEL**

## MSI Plessey Check Digits

These check digits at the end of the bar code verify the integrity of the data. At least one check digit is always required. Check digits are not automatically transmitted with the data.

**One MSI Plessey Check Digit**

**Two MSI Plessey Check Digits**

## Transmit MSI Plessey Check Digit

When enabled, MSI Plessey Check Digit is sent to the host.

**Enable Transmit MSI Plessey Check Digit**

**Disable Transmit MSI Plessey Check Digit**

## MSI Plessey Check Digit Algorithm

When the two MSI Plessey Check Digits option is selected, an additional verification is required to ensure integrity. Either of the two following algorithms may be selected.

**MOD 10/MOD 10**

**MOD 11/MOD 10**

# *Data Options*

## Transmit Code ID Character

A code ID character identifies the code type of a scanned bar code. This may be useful when the scanner is decoding more than one code type. In addition to any single-character prefixes already selected, the code ID character is appended as a prefix to the decode. The user may select no code ID character, a Symbol Code ID character, or an AIM Code ID character.

**SYMBOL**
**Code ID Character**

**AIM Code ID Character**

**None**

## Prefix

The scanner adds one of the following start-of-text characters to transmitted data.

- None
- One user-defined prefix (can be any ASCII character). See Appendix A, *ASCII Character Set* for more information.

**Prefix None**

**User's Choice Prefix Character**

## Suffix

Select one or two end-of-text characters to be added to transmitted data.

- None
- CR (Carriage Return) - Returns the cursor to the same position on the line after each decode.

**Suffix None**

**Suffix Enter**

**User's Choice Suffix 1**

**User's Choice Suffix 2**

## Prefix/Suffix Values

**0**

**1**

**2**

**3**

**4**

**5**

**6**

**7**

**8**

**9**

**Cancel**

## Data Transmission Format

This option changes the data transmission format.

**<Data As Is>**

**<Data><Suffix 1><Suffix 2>**

**<Prefix><Data>**

**<Prefix><Data><Suffix 1><Suffix 2>**

## *Caps Lock Scan Data*

This option performs the CAPS LOCKS function for the scanned data transmission. “A” to “Z” character (scanned data) is transmitted with CAPS ON/OFF.

**Caps Lock Off**

**Caps Lock On**

## *Ignore Unknown Character*

Unknown characters are those unrecognized by the host. When Send Bar Codes with Unknown Characters is selected, all bar code data is sent, excepts for unknown characters, and no error beeps are sounded. When Do Not Send Bar codes with Unknown Characters is selected, no bar code data containing at least one unknown character is sent to the host.

**Send Bar Codes with Unknown Characters**

**Do Not Send Bar Codes with Unknown Characters**

## *Communications Delays and Time-Outs (Intercharacter Delay)*

Selecting the intercharacter delay gives the host system time to service its receiver and perform other tasks between characters. Select from no delay to a 99msec. delay between transmission of each character.

**Intercharacter Delay**

## Communications Delays and Time-Outs (Intercharacter Delay) (cont'd)

**0**

**1**

**2**

**3**

**4**

**5**

**6**

**7**

**8**

**9**

**Cancel**

## *Communications Prefix/Suffix Delays and Time-outs (Interpacket Delay)*

Selecting the Prefix/Suffix Delay gives the host system time to service its receiver and perform other tasks between DataPacket. Select from no delay to a 9.9 sec. delay between transmission of each DataPacket.

**Prefix/Suffix Delay**

## Communications Prefix/Suffix Delays and Timeouts (cont'd)

**0**

**1**

**2**

**3**

**4**

**5**

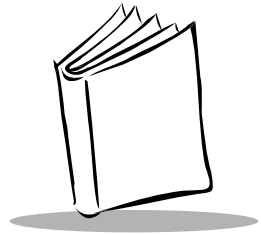
**6**

**7**

**8**

**9**

**Cancel**



# *Appendix A*
# *ASCII Character Set*

**Table A-1. ASCII Character Set**

| ASCII Value | Full ASCII Code 39 Encode Char. | Keystroke | ASCII Value | Full ASCII Code 39 Encode Char | Keystroke |
|---|---|---|---|---|---|
| 000 | %U | CTRL 2 | 024 | $X | CTRL X |
| 001 | $A | CTRL A | 025 | $Y | CTRL Y |
| 002 | $B | CTRL B | 026 | $Z | CTRL Z |
| 003 | $C | CTRL C | 027 | %A | CTRL [ |
| 004 | $D | CTRL D | 028 | %B | CTRL \ |
| 005 | $E | CTRL E | 029 | %C | CTRL ] |
| 006 | $F | CTRL F | 030 | %D | CTRL 6 |
| 007 | $G | CTRL G | 031 | %E | CTRL - |
| 008 | $H | CTRL H | 032 | Space | Space |
| 009 | $I | CTRL I | 033 | / A | ! |
| 010 | $J | CTRL J | 034 | / B | ‘ |
| 011 | $K | CTRL K | 035 | / C | # |
| 012 | $L | CTRL L | 036 | / D | $ |
| 013 | $M | CTRL M | 037 | / E | % |
| 014 | $N | CTRL N | 038 | / F | & |
| 015 | $O | CTRL O | 039 | / G | ‘ |
| 016 | $P | CTRL P | 040 | / H | ( |

**Table A-1. (Continued) ASCII Character Set**

| 017 | $Q | CTRL Q | 041 | /I | ) |
|---|---|---|---|---|---|
| 018 | $R | CTRL R | 042 | /J | * |
| 019 | $S | CTRL S | 043 | /K | + |
| 020 | $T | CTRL T | 044 | /L | , |
| 021 | $U | CTRL U | 045 | - | - |
| 022 | $V | CTRL V | 046 | . | . |
| 023 | $W | CTRL W | 047 | / | / |
| **ASCII Value** | **Full ASCII Code 39 Encode Char.** | **Keystroke** | **ASCII Value** | **Full ASCII Code 39 Encode Char** | **Keystroke** |
| 048 | 0 | 0 | 073 | I | I |
| 049 | 1 | 1 | 074 | J | J |
| 050 | 2 | 2 | 075 | K | K |
| 051 | 3 | 3 | 076 | L | L |
| 052 | 4 | 4 | 077 | M | M |
| 053 | 5 | 5 | 078 | N | N |
| 054 | 6 | 6 | 079 | O | O |
| 055 | 7 | 7 | 080 | P | P |
| 056 | 8 | 8 | 081 | Q | Q |
| 057 | 9 | 9 | 082 | R | R |
| 058 | /Z | : | 083 | S | S |
| 059 | %F | ; | 084 | T | T |
| 060 | %G | < | 085 | U | U |
| 061 | %H | = | 086 | V | V |
| 062 | %I | > | 087 | W | W |
| 063 | %J | ? | 088 | X | X |
| 064 | %V | @ | 089 | Y | Y |
| 065 | A | A | 090 | Z | Z |
| 066 | B | B | 091 | %K | [ |
| 067 | C | C | 092 | %L | \ |

**Table A-1. (Continued) ASCII Character Set**

| 068 | D | D | 093 | %M | ] |
|---|---|---|---|---|---|
| 069 | E | E | 094 | %N | ^ |
| 070 | F | F | 095 | %O | _ |
| 071 | G | G | 096 | %W | ‘ |
| 072 | H | H | 097 | +A | a |
| **ASCII Value** | **Full ASCII Code 39 Encode Char.** | **Keystroke** | **ASCII Value** | **Full ASCII Code 39 Encode Char** | **Keystroke** |
| 098 | +B | b | 113 | +Q | q |
| 099 | +C | c | 114 | +R | r |
| 100 | +D | d | 115 | +S | s |
| 101 | +E | e | 116 | +T | t |
| 102 | +F | f | 117 | +U | u |
| 103 | +G | g | 118 | +V | v |
| 104 | +H | h | 119 | +W | w |
| 105 | +I | i | 120 | +X | x |
| 106 | +J | j | 121 | +Y | y |
| 107 | +K | k | 122 | +Z | z |
| 108 | +L | l | 123 | %P | { |
| 109 | +M | m | 124 | %Q | \| |
| 110 | +N | n | 125 | %R | } |
| 111 | +O | o | 126 | %S | ~ |
| 112 | +P | p | 127 | | Undefined |
| 264 | ALT 2 | 275 | ALT K | 286 | ALT V |
| 265 | ALT A | 276 | ALT L | 287 | ALT W |
| 266 | ALT B | 277 | ALT M | 288 | ALT X |
| 267 | ALT C | 278 | ALT N | 289 | ALT Y |
| 268 | ALT D | 279 | ALT O | 290 | ALT Z |
| 269 | ALT E | 280 | ALT P | 291 | ALT [ |
| 270 | ALT F | 281 | ALT Q | 292 | ALT \ |

**Table A-1. (Continued) ASCII Character Set**

| | | | | | |
|---|---|---|---|---|---|
| 271 | ALT G | 282 | ALT R | 293 | ALT ] |
| 272 | ALT H | 283 | ALT S | 294 | ALT 6 |
| 273 | ALT I | 284 | ALT T | 295 | ALT - |
| 274 | ALT J | 285 | ALT U | | |
| | | | | | |
| **Misc. Key** | **Keystroke** | **Misc. Key** | **Keystroke** | **Misc. Key** | **Keystroke** |
| 301 | PA 1 | 309 | CMD 7 | 317 | ° |
| 302 | PA 2 | 310 | CMD 8 | 318 | 1 / 2 |
| 303 | CMD 1 | 311 | CMD 9 | 319 | ¶ |
| 304 | CMD 2 | 312 | CMD 10 | 320 | § |
| 305 | CMD 3 | 313 | ¥ | 321 | \| |
| 306 | CMD 4 | 314 | £ | 322 | 0 / 00 |
| 307 | CMD 5 | 315 | ¤ | | |
| 308 | CMD 6 | 316 | ¬ | | |
| | | | | | |

**Table A-1. (Continued) ASCII Character Set**

| PF Keys | Keystroke | PF Keys | Keystroke | PF Keys | Keystroke |
|---|---|---|---|---|---|
| 401 | PF 1 | 409 | PF 9 | 417 | PF 17 |
| 402 | PF 2 | 410 | PF 10 | 418 | PF 18 |
| 403 | PF 3 | 411 | PF 11 | 419 | PF 19 |
| 404 | PF 4 | 412 | PF 12 | 420 | PF 20 |
| 405 | PF 5 | 413 | PF 13 | 421 | PF 21 |
| 406 | PF 6 | 414 | PF 14 | 422 | PF 22 |
| 407 | PF 7 | 415 | PF 15 | 423 | PF 23 |
| 408 | PF 8 | 416 | PF 16 | 424 | PF 24 |
| | | | | | |
| **F Keys** | **Keystroke** | **F Keys** | **Keystroke** | **F Keys** | **Keystroke** |
| 501 | F 1 | 514 | F 14 | 527 | F 27 |
| 502 | F 2 | 515 | F 15 | 528 | F 28 |
| 503 | F 3 | 516 | F 16 | 529 | F 29 |
| 504 | F 4 | 517 | F 17 | 530 | F 30 |
| 505 | F 5 | 518 | F 18 | 531 | F 31 |
| 506 | F 6 | 519 | F 19 | 532 | F 32 |
| 507 | F 7 | 520 | F 20 | 533 | F 33 |
| 508 | F 8 | 521 | F 21 | 534 | F 34 |
| 509 | F 9 | 522 | F 22 | 535 | F 35 |
| 510 | F 10 | 523 | F 23 | 536 | F 36 |
| 511 | F 11 | 524 | F 24 | 537 | F 37 |
| 512 | F 12 | 525 | F 25 | 538 | F 38 |
| 513 | F 13 | 526 | F 26 | 539 | F 39 |

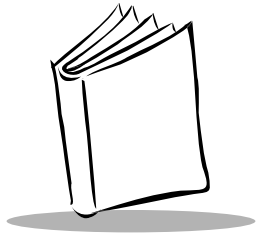
**Table A-1. (Continued) ASCII Character Set**

| Numeric Keypad | Keystroke | Numeric Keypad | Keystroke | Numeric Keypad | Keystroke |
|---|---|---|---|---|---|
| 642 | * | 649 | 1 | 656 | 8 |
| 643 | + | 650 | 2 | 657 | 9 |
| 644 | Undefined | 651 | 3 | 658 | Enter |
| 645 | - | 652 | 4 | 659 | Num Lock |
| 646 | . | 653 | 5 | 660 | 00 |
| 647 | / | 654 | 6 | | |
| 648 | 0 | 655 | 7 | | |
| | | | | | |
| **Extended Keypad** | **Keystroke** | **Extended Keypad** | **Keystroke** | **Extended Keypad** | **Keystroke** |
| 701 | Break | 708 | Backspace | 715 | Up Arrow |
| 702 | Delete | 709 | Tab | 716 | Dn Arrow |
| 703 | Pg Up | 710 | Print Screen | 717 | Left Arrow |
| 704 | End | 711 | Insert | 718 | Right Arrow |
| 705 | Pg Dn | 712 | Home | 719 | Back Tab |
| 706 | Pause | 713 | Enter | | |
| 707 | Scroll Lock | 714 | Escape | | |

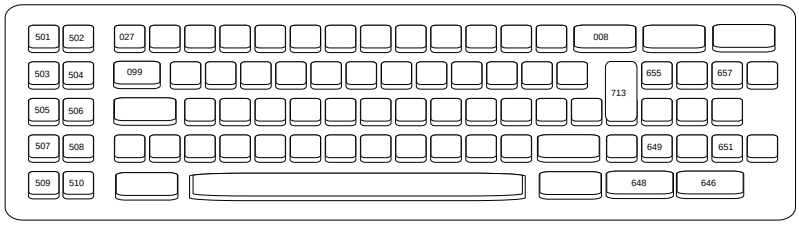
## Table A-2. Encoded Full ASCII Code 39 Characters & Keyboard Output

| Keystroke ID | NCR 7052 | All Others* | Keystroke ID | NCR 7052 | All Others* |
|---|---|---|---|---|---|
| &U | None | None | /G | None | ‘ |
| $A | F1 | None | /H | None | ( |
| $B | F2 | DEL | /I | None | ) |
| $C | F3 | PGUP | /J | None | * |
| $D | F4 | END | /K | + | + |
| $E | F5 | PGDN | /L | None | , |
| $F | F6 | None | - | - | - |
| $G | F7 | None | . | . | . |
| $H | F8 | BKSPACE | /O | None | / |
| $I | F9 | HORIZ TAB | 0 | 0 | 0 |
| $J | F10 | None | 1 | 1 | 1 |
| $K | None | INS | 2 | 2 | 2 |
| $L | None | HOME | 3 | 3 | 3 |
| $M | ENTER | ENTER | 4 | 4 | 4 |
| $N | None | None | 5 | 5 | 5 |
| $O | None | None | 6 | 6 | 6 |
| $P | F11 | None | 7 | 7 | 7 |
| $Q | F12 | F1 | 8 | 8 | 8 |
| $R | F13 | F2 | 9 | 9 | 9 |
| $S | F14 | F3 | /Z | None | : |
| $T | F15 | F4 | %F | None | ; |
| $U | F16 | F5 | %G | None | < |
| $V | F17 | F6 | %H | None | = |
| $W | F18 | F7 | %I | None | > |
| $X | F19 | F8 | %J | None | ? |
| $Y | None | F9 | %V | None | @ |
| $Z | None | F10 | A-Z | A-Z | A-Z |
| %A | None | ESC | %K | None | None |
| %B | None | None | %L | None | \ |
| %C | None | None | %M | None | None |
| %D | None | None | %N | None | None |
| %E | None | None | %O | None | _ |
| SPACE | SPACE | SPACE | %W | None | ‘ |
| /A | None | ! | +A-+Z | None | a-z |
| /B | None | ‘ | %P | None | { |
| /C | None | # | %Q | None | \| |
| /D | None | $ | %R | None | } |
| /E | None | % | %S | None | ~ |
| /F | None | & | %T | None | None |

*”All Others” Include: IBM AT/XT, PS2/30, 50, 60, Compaq 386 and Deskpro, NCR PC4, Columbia PC, Tandy HD1200, Adds PC I/II, Leading Edge, ITT PC, Sperry PC, Pitney Bowes A2000, NCR PC8, Zenith 248, HP Vectra CS/ES



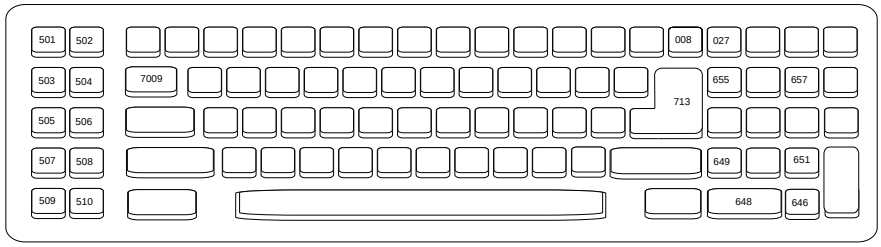
# *Appendix B*
# *Keyboard Identifier Maps*




**IBM PC/XT**
**NCR PC4**
**COMPAQ DESKPRO**
**COLUMBIA PC**

**TANDY HD 1200**
**ADDS PC I/II**
**LEADING EDGE PC**
**HP VECTRA CS**

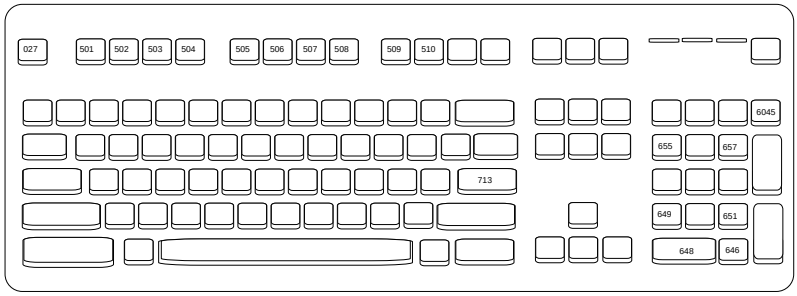
**ITT PC**
**SPERRY PC**
**PITNEY BOWES A2000**



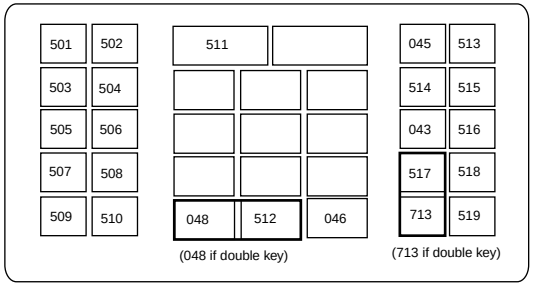

**IBM PC/AT**

**NCR PC8**

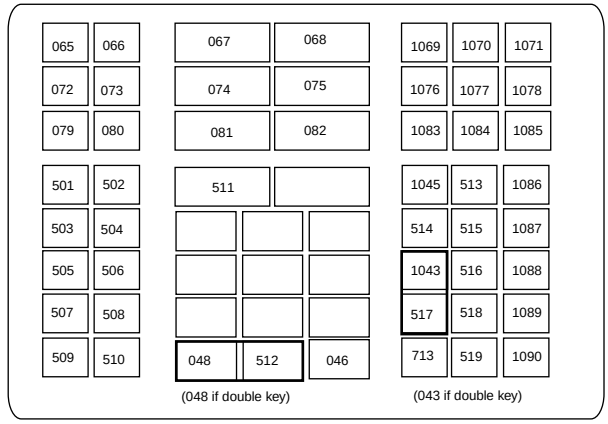
**ZENITH 248**



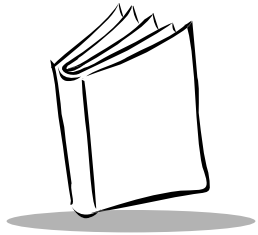

**IBM PS/2** **COMPAQ 386**




**NCR 7052 32-KEY**




**NCR 7052 58-KEY**



# *Glossary*

**ASCII** - American Standard Code for Information Interchange. A 7 bit code representing 128 letters, numerals, punctuation marks, and control characters. It is a standard data transmission code in the U.S.

**BIT** - Binary digit. One bit is the basic unit of binary information. Generally, eight consecutive bits compose one byte of data. The pattern of 0 and 1 values within the byte determines its meaning.

**BOOKLAND EAN -** A specially-formatted European Article Numbering symbol with 13 characters (EAN-13), the first 3 of which are “978”.

**BYTE** - On an addressable boundary, eight adjacent binary digits (0 and 1) combined in a pattern to represent a specific character or numeric value. Bits are numbered from the right, 0 through 7, with bit 0 the low-order bit. One byte in memory can be used to store one ASCII character.

**CDRH** - Center for Devices and Radiological Health. A federal agency responsible for regulating laser product safety. This agency specifies various laser operation classes based on power output during operation.

**CHECK DIGIT** - A digit used to verify a correct symbol decode. The scanner inserts the decoded data into an arithmetic formula and checks that the resulting number matches the encoded check digit. Check digits are required for UPC but are optional for other symbologies. Using check digits decreases the chance of substitution errors when a symbol is decoded.

**CODABAR** - A discrete self-checking code with a character set consisting of digits 0 to 9 and six additional characters: (- $ : / , +).

**CODE 128** - A high density symbology which allows the controller to encode all 128 ASCII characters without adding extra symbol elements.

**CODE 3 OF 9 (CODE 39)** - A versatile and widely used alphanumeric bar code symbology with a set of 43 character types, including all uppercase letters, numerals from 0 to 9, and 7 special characters (- . / + % $ and space). The code name is derived from the fact that 3 of 9 elements representing a character are wide, while the remaining 6 are narrow.

**CODE 93** - An industrial symbology compatible with Code 39 but offering a full character ASCII set and a higher coding density than Code 39.

**CONTINUOUS SYMBOLOGY** - A bar code or symbol in which all spaces within the symbol are parts of characters. There are no intercharacter gaps in a continuous code. The absence of gaps allows for greater information density.

**DECODE** - To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned.

**DECODE ALGORITHM** - A decoding scheme that converts pulse widths into data representation of the letters or numbers encoded within a bar code symbol.

**DISCRETE SYMBOLOGY** - A bar code or symbol in which the spaces between characters (intercharacter gaps) are not part of the code.

**DISCRETE 2 OF 5** - A binary bar code symbology representing each character by a group of five bars, two of which are wide. The location of wide bars in the group determines which character is encoded; spaces are insignificant. Only numeric characters (0 to 9) and START/STOP characters may be encoded.

**EAN** - European Article Number. This European/International version of the UPC provides its own coding format and symbology standards. Element dimensions are specified metrically. EAN is used primarily in retail.

**HOST COMPUTER** - A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs, and network control.

**IEC** - International Electrotechnical Commission. This international agency regulates laser safety by specifying various laser operation classes based on power output during operation.

**IEC CLASS I (IEC 825 Class I)** - This is the lowest power IEC laser classification. Conformity is ensured through a software restriction of 25 seconds of laser operation within any 100 second window and an automatic laser shutdown if the scanner's oscillating mirror fails.

**INTERCHARACTER GAP** - The space between two adjacent bar code characters in a discrete bar code.

**INTERLEAVED BAR CODE** - A bar code in which characters are paired together, using bars to represents the first character and the intervening spaces to represent the second.

**INTERLEAVED 2 OF 5** - A binary bar code symbology representing character pairs in groups of five bars and five interleaved spaces. Interleaving provides for greater information density. The location of wide elements (bar / spaces) within each group determines which characters are encoded. This continuous code type uses no intercharacter spaces. Only numeric (0 to 9) and START / STOP characters may be encoded.

**LASER** - An acronym for Light Amplification by Stimulated Emission of Radiation. The laser is an intense light source. Light from a laser is all the same frequency, unlike the output of an incandescent bulb. Laser light is typically coherent and has a high energy density.

**LASER DIODE** - A semiconductor type of laser connected to a power source to generate a laser beam. This laser type is a compact source of coherent light.

**PARAMETER** - A variable that can have different values assigned to it.

**PROGRAMMING MODE** - The state in which a scanner is configured for parameter values. See **SCANNING MODE**.

**QUIET ZONE** - A clear space, containing no dark marks, which precedes the start character of a bar code symbol and follows the stop character.

**REDUNDANCY -** A decoding method which requires a bar code be recognized redundantly on a number of sweeps of the scan beam before a decode is declared. While slowing the time-to-decode, redundancy can help lower the possibility of a mis-decode of poorly printed symbols.

**SCANNER** - An electronic device used to scan bar code symbols and produce a digitized pattern that corresponds to the bars and spaces of the symbol. Its three main components are:

1. Light source (laser or photoelectric cell) - illuminates a bar code.
2. Photodetector - registers the difference in reflected light (more light reflected from spaces).
3. Signal conditioning circuit - transforms optical detector output into a digitized bar pattern.

**SCANNING MODE** - The scanner is energized, programmed, and ready to read a bar code.

**SCANNING SEQUENCE** - A method of programming or configuring parameters for a bar code reading system by scanning bar code menus.

**SELF-CHECKING CODE** - A symbology that uses a checking algorithm to detect encoding errors within the characters of a bar code symbol.

**START/STOP CHARACTER** - A pattern of bars and spaces that provides the scanner with start and stop reading instructions and scanning direction. The start and stop characters are normally to the left and right margins of a horizontal code.

**SYMBOL** - A scannable unit that encodes data within the conventions of a certain symbology, usually including start/stop characters, quiet zones, data characters, and check characters.

**SYMBOLOGY** - The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39).

**UPC** - Universal Product Code. A relatively complex numeric symbology. Each character consists of two bars and two spaces, each of which can be any of four widths. The standard symbology for retail food packages in the United States.

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