# P 300STD/FZY/PRO Scanner

# Product Reference Guide

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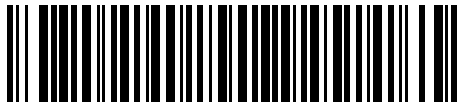

72-39417-03
Revision A — October 2000

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

# *P 300STD/FZY/PRO Scanner*
# *Product Reference Guide*

*72-39417-03*
*Revision A*
*October 2000*

symbol®

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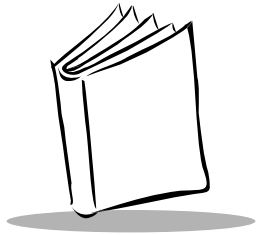

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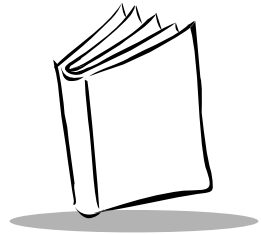

# About This Guide

## Introduction

The *P 300STD/FZY/PRO Scanner Product Reference Guide* provides instructions for setting up, programming, using, maintaining and troubleshooting the P 300STD, P 300FZY and P 300PRO scanner.

## Chapter Descriptions

Chapter 1, *Getting Started*, provides a product overview and instructions on setting up your scanner. Also included are detailed instruction on scanning 1- and 2-dimensional bar codes, as well as definitions for each of the beeper indications.

Chapter 2, *Programming the Scanner*, contains all the bar codes necessary to program your P 300 scanner.

Chapter 3, *Advanced Data Formatting (ADF)*, explains how to customize scanned data before transmission to your host.

Chapter 4, *Maintenance and Troubleshooting*, describes cleaning your scanner, and provides a list of possible problems you may encounter with your scanner, and solutions to these problems.

Appendix A, *Programming Reference*, provides information on AIM identifiers and prefix/suffix values.

Appendix B, *Keyboard Maps*, illustrates the keyboard maps for use with the keyboard wedge interface.

Appendix C, *ASCII Character Set*, provides a table of ASCII character conversions.

Appendix D, *Technical Specifications*, lists the technical specifications for the scanner, and provides illustrations of the decode zones.

## Audience

The intended audience for this manual is personnel performing installation/setup, programming and troubleshooting of P 300 Series scanners.

## Notational Conventions

The following conventions are used in this document:

- Italics are used to highlight specific items in the general text, and to identify chapters and sections in this and related documents.
- 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

- *P 300 (STD/FZY/PRO) Series Quick Reference Guide*, p/n 72-39416-xx, provides instructions on setting up and using the scanner. Default programming parameters are listed as well.
- *P 300IMG Imager Quick Reference Guide*, p/n 72-40804-xx, provides instructions on setting up and using the imager version of this product.
- *P 300IMG Imager Product Reference Guide*, p/n 72-40805-xx, provides the setup, maintenance, troubleshooting, programming and operating instructions for the imager version of this product.

## Service Information

If you have a problem with your equipment, contact the Symbol Support Center for your region. See page xi for contact information. 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 4Z2
905-629-7226

**United Kingdom**
Symbol Technologies
Symbol Place
Winnersh Triangle, Berkshire RG41 5TP
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0800 328 2424 (Inside UK)
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230 Victoria Street #04-05
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28042 Madrid, Spain
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**Sweden**
Symbol Technologies AB
Albygatan 109D
Solna
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84452900 (Inside Sweden)
+46 84452900 (Outside Sweden)

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

# Warranty

Symbol Technologies, Inc ("Symbol") manufactures its hardware products in accordance with industry-standard practices. Symbol warrants that for a period of twelve (12) months from date of shipment, products will be free from defects in materials and workmanship.

This warranty is provided to the original owner only and is not transferable to any third party. It shall not apply to any product (i) which has been repaired or altered unless done or approved by Symbol, (ii) which has not been maintained in accordance with any operating or handling instructions supplied by Symbol, (iii) which has been subjected to unusual physical or electrical stress, misuse, abuse, power shortage, negligence or accident or (iv) which has been used other than in accordance with the product operating and handling instructions. Preventive maintenance is the responsibility of customer and is not covered under this warranty.

Wear items and accessories having a Symbol serial number, will carry a 90-day limited warranty. Non-serialized items will carry a 30-day limited warranty.

## *Warranty Coverage and Procedure*

During the warranty period, Symbol will repair or replace defective products returned to Symbol's manufacturing plant in the US. For warranty service in North America, call the Symbol Support Center at 1-800-653-5350. International customers should contact the local Symbol office or support center. If warranty service is required, Symbol will issue a Return Material Authorization Number. Products must be shipped in the original or comparable packaging, shipping and insurance charges prepaid. Symbol will ship the repaired or replacement product freight and insurance prepaid in North America. Shipments from the US or other locations will be made F.O.B. Symbol's manufacturing plant.

Symbol will use new or refurbished parts at its discretion and will own all parts removed from repaired products. Customer will pay for the replacement product in case it does not return the replaced product to Symbol within 3 days of receipt of the replacement product. The process for return and customer's charges will be in accordance with Symbol's Exchange Policy in effect at the time of the exchange.

Customer accepts full responsibility for its software and data including the appropriate backup thereof.

Repair or replacement of a product during warranty will not extend the original warranty term.

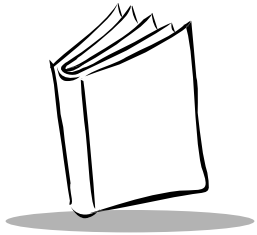
Symbol's Customer Service organization offers an array of service plans, such as on-site, depot, or phone support, that can be implemented to meet customer's special operational requirements and are available at a substantial discount during warranty period.

## General

Except for the warranties stated above, Symbol disclaims all warranties, express or implied, on products furnished hereunder, including without limitation implied warranties of merchantability and fitness for a particular purpose. The stated express warranties are in lieu of all obligations or liabilities on part of Symbol for damages, including without limitation, special, indirect, or consequential damages arising out of or in connection with the use or performance of the product.

Seller's liability for damages to buyer or others resulting from the use of any product, shall in no way exceed the purchase price of said product, except in instances of injury to persons or property.

Some states (or jurisdictions) do not allow the exclusion or limitation of incidental or consequential damages, so the proceeding exclusion or limitation may not apply to you.



# Chapter 1
# Getting Started

## Introduction

A combination of superb performance and ease of use, the rugged, versatile P 300 series of industrial hand-held scanners offers a wide choice of scanners to meet the demands of your data management tasks in extreme environments.

Here's what each member of the P 300 family offers you:

- **P 300STD**: undecoded version of the scanner.
- **P 300FZY**: decodes damaged or poorly printed bar codes; uses multi-interfaces of RS-232, Wand Emulation, Keyboard Wedge, and Synapse.
- **P 300PRO**: performs one and two-dimensional bar code scanning; uses multi-interfaces of RS-232 and Synapse.
- **P 300IMG**: performs point-and-shoot image capture, outputs to digital formats of TIFF, JPEG, and BMP. This version is covered in the *P 300IMG Quick Reference Guide*, p/n 72-40804-xx and the *P 300IMG Imager Product Reference Guide*, p/n 72-40805-xx.

## Unpacking

Remove the P 300 Series 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 on page xi. **KEEP THE PACKING.** It is the approved shipping container and should be used if you ever need to return your equipment for servicing.

# Accessories

Depending on your host system's configuration, the following items may be included with your scanner. These items are also available through your local Symbol representative or business partner.

## Cables

- Power Supply: p/n 50-14001-001
- DC Power Adapter: p/n 50-16002-009
- AC Line Cord: (part number is country-specific)
- Undecoded Cable: p/n 25-38697-01
- RS-232 Cable: p/n 25-38698-01
- Keyboard Wedge Cable: 25-38699-01
- Wand Emulation Cable: 25-39803-01
- Synapse Cable: 25-38700-01

## User Documentation

The following user documentation is provided with your scanner:

- *P 300 Scanner Quick Reference Guide*, p/n 72-39416-xx
- *P 300 Scanner Series Product Reference Guide*, p/n 72-39417-xx.

## Optional Accessories

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

# Setting Up the P 300 Scanner

## Installing the Cable

Insert the cable into the receptacle on the bottom of the scanner, and twist to the right as shown:

**Note:** *Do not pull the trigger while installing a cable on the scanner.*

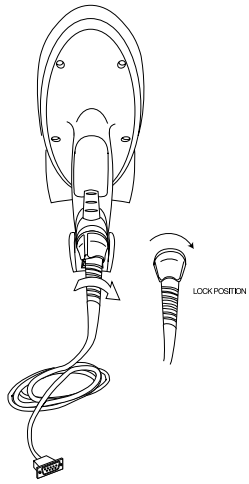



**Figure 1-1. Installing the Cable**

## Switching Cables

Different cables are required for different hosts. To change the scanner cable:

1. Turn the cable counter-clockwise to unlock.
2. Pull the cable out of the receptacle on the bottom of the scanner.
3. Insert a new cable in the receptacle. Press the cable into the receptacle and twist to the right.

---

**Note:** *Do not pull the trigger while installing a cable on the scanner.*

---

## Connecting Power

If your host does not provide power to the scanner, you will need to connect external power to the scanner.

1. Connect the interface cable to the bottom of the scanner, as described in *Installing the Cable*.
2. Connect the DC cable right-angle connector into the power port on the interface cable. Plug the other end of the DC cable into the power supply.
3. Connect the AC line cord into the power supply. Plug the other end into a wall outlet.

# Connecting to a Host

The P 300 series scanners support a variety of host interfaces. The P 300FZY uses RS-232, Synapse, Keyboard Wedge and Wand emulation to interface to a host system. The P 300PRO uses RS-232 and Synapse to interface to a host system. This section describes how to make each of these connections.

## RS-232 Connection

Both the P 300FZY and P300PRO scanner use RS-232 to interface to a host system. This connection can be made either directly from the scanner to the host, or indirectly through a Synapse adapter cable to the host.

### *RS-232 Direct Connection*

1. Connect the interface cable to the bottom of the scanner, as described in *Installing the Cable* on page 1-2.
2. Connect the other end of the cable to the serial port on the host.

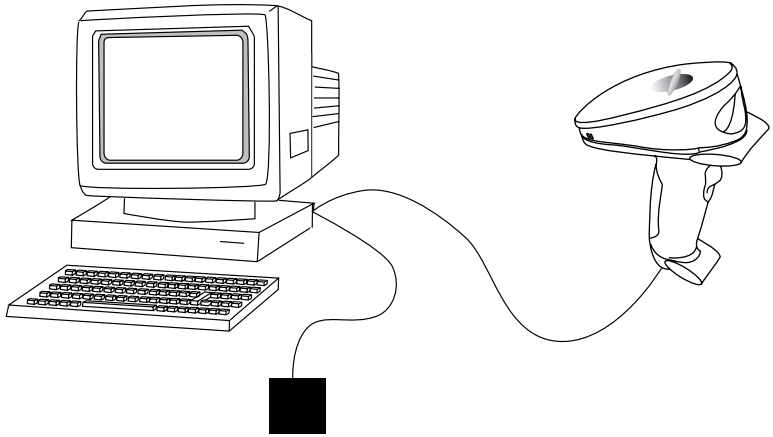


**Figure 1-2. RS-232 Direct Connection**

3. Plug one end of the power supply into the power receptacle on the RS-232 cable. Plug the other end into a wall outlet.

## Wand Emulation Connection

To perform Wand emulation, the scanner can be connected to a portable data terminal, or a controller which collects the data as wand data, and interprets it for the host.

1. Connect the wand emulation interface cable (p/n 25-39803-01) to the bottom of the scanner, as described in *Installing the Cable* on page 1-2.
2. Connect the other end of the interface cable into the COM port on the PDT or Controller.

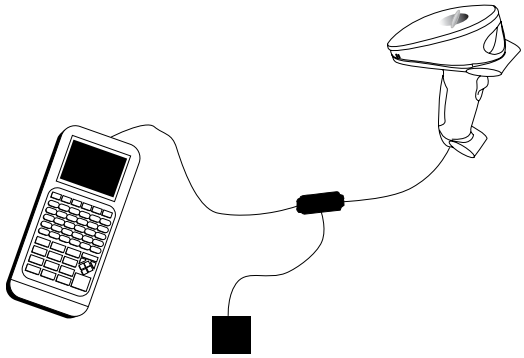


**Figure 1-3. Wand Emulation Connection**

3. Plug one end of the power cable into the power receptacle on the interface cable, and plug the other end into a wall outlet.

## Keyboard Wedge Connection

When configured for keyboard wedge input, the host accepts input from the scanner as keystrokes. The P 300 can perform keyboard wedge input using a keyboard wedge cable, or via the Synapse cable.

To connect the keyboard wedge cable:

1. Connect the keyboard wedge interface cable (p/n 25-38699-01) to the bottom of the scanner, as described in *Installing the Cable* on page 1-2.

2. Connect the male end of the keyboard cable into the female end of the interface cable. Connect the male end of the interface cable into the keyboard port on the host.

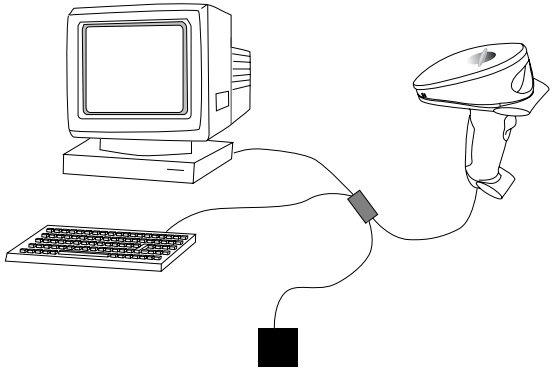


**Figure 1-4. Keyboard Wedge Connection**

3. Plug one end of the power cable into the power receptacle on the interface cable, and plug the other end into a wall outlet.

## Synapse Cable Connection

Symbol's Synapse Smart Cables enable interfacing to a variety of hosts. The Synapse cable has the built-in intelligence to detect the host to which it is connected.

1. Connect the Synapse adapter cable into the bottom of the scanner, as described in *Installing the Cable* on page 1-2.
2. Plug the other end of the Synapse adapter cable into the Synapse Smart Cable.

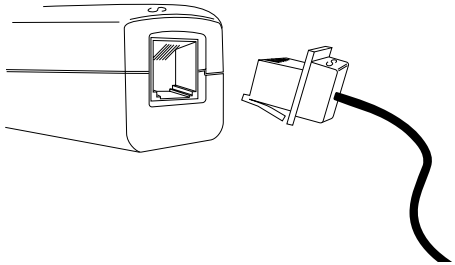


**Figure 1-5. Synapse Cable Connection**

3. Connect the other end of the Synapse smart cable into the host.

### *RS-232 Connection using Synapse*

1. Connect the interface cable to the bottom of the scanner, as described in *Installing the Cable* on page 1-2.
2. Plug the other end of the interface cable into the Synapse Smart Cable.
3. Connect the other end of the Synapse Smart Cable to the host.

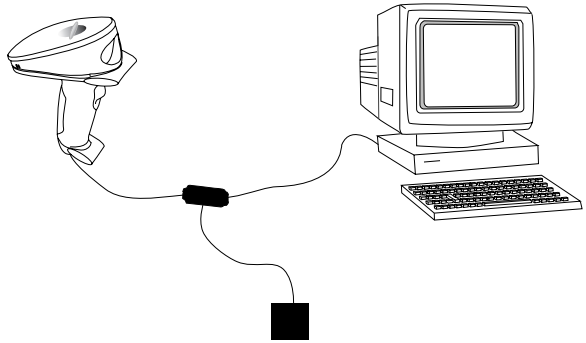


**Figure 1-6. RS-232 Connection using Synapse**

4. If needed, plug one end of the power supply into the power receptacle on the RS-232 cable. Plug the other end into a wall outlet.
5. If needed, plug one end of the power supply into the power receptacle on the RS-232 cable. Plug the other end into a wall outlet.

### *Keyboard Wedge Connection using Synapse*

To connect the Synapse cable with Keyboard Wedge:

1. Connect the interface cable to the bottom of the scanner, as described in *Installing the Cable* on page 1-2.
2. Connect the other end of the interface cable into the Synapse cable.

3. The other end of the Synapse cable has 2 “flying leads”. Connect the male end of the lead into the female end of the keyboard cable. Connect the male end of the lead into the keyboard port on the host.

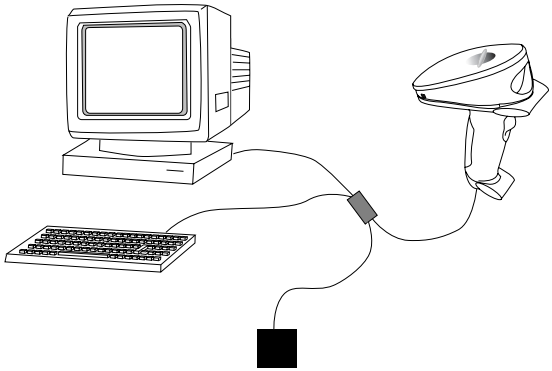


**Figure 1-7. Keyboard Wedge via Synapse Connection**

### *Programming the Scanner*

Once the connections are made to the host, the scanner must be programmed to work with that host. Refer to Chapter 2, *Programming the Scanner* for the specific bar code programming information.

## P 300PRO Scanning Mode Options

The P 300PRO supports several scanning options:

### *Smart Raster*

The P 300PRO programmable “Smart Raster” capability causes the scanner to emit a raster pattern dynamically adjusted to the particular PDF417 bar code’s height. To increase scanning efficiency and decrease decode time, the scanner determines the height of the bar code, opening at a size optimal for decoding that bar code.

In normal “Smart Raster” operation, a trigger pull causes a slab raster pattern to appear. If the target is a 1-D bar code, the scanner decodes the symbol. If the target bar code is PDF417,

the scanning patterns open up to a full, optimized raster pattern as soon as the scanner is properly aligned over the bar code.

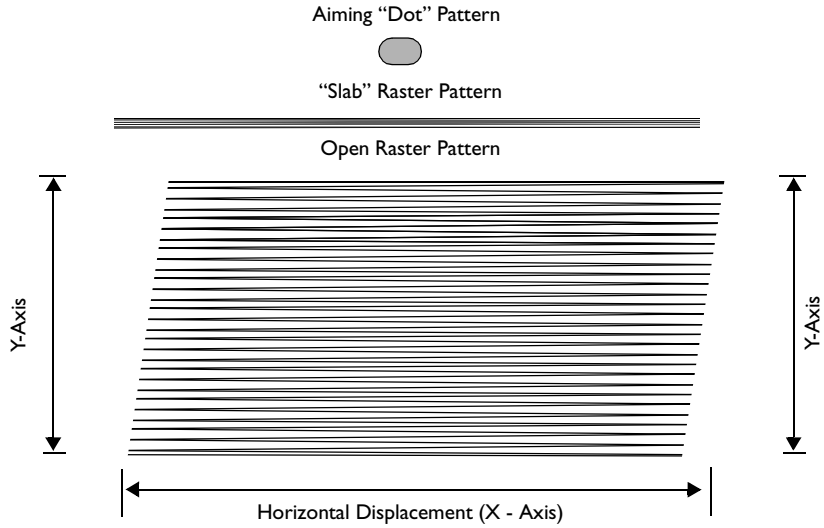



**Figure 1-8. P 300PRO Aiming and Scanning Patterns**

For best operation in Smart Raster mode, keep the scan pattern as parallel to the symbol's rows as possible, keep the scanner as still as possible, and hold the scanner at an angle which does not give specular reflection. Likewise, the symbol should be in good condition.

Unless otherwise programmed, the P 300PRO operates with Smart Raster performance.

## *Slab Only Raster*

Scanner activation creates a slab raster pattern which does not open vertically, regardless of bar code type. This may provide optimal performance on small PDF417 and 1D bar codes.

## *Always Raster*

When programmed to this option, the scanner directly opens the raster pattern to the programmed height and at the programmed expansion speed when the trigger is pulled.

## *Programmable Raster*

The user programs the height of the raster pattern and the rate at which it expands. Scanner activation creates the slab raster pattern which only opens for PDF417 or MicroPDF417 bar

codes, useful when decoding low-profile 1D and 2D bar codes where over-scanning is not desired. Note that the height and expansion rate are directly, but not linearly, proportional to their respective parameter values.

# Aiming Modes

There are two aiming modes: aiming with a dot pattern, or with a slab raster pattern. Note that aiming modes do not work with the Always Raster scanning option.

## *Aiming Dot Option*

A trigger pull creates the single dot aiming pattern, which lasts for a fixed interval. This dot can easily be seen in outdoor or high ambient light environments. A slab raster pattern or an open raster pattern appears next, depending on the programmed scanning option. There are two programmable timeout periods for this option — normal and extended.

## *Slab Raster Option*

A trigger pull creates the slab raster pattern. If the target is a 1-D bar code, the pattern never gets beyond a slab raster. If the target bar code is PDF417, the pattern opens up to an optimized raster pattern as soon as the scanner is properly aligned over the bar code.

# Scanning 1D Bar Codes

To scan a 1D bar code:

1. Make sure all connections are secure, and the symbol you want to scan is within the scanning range (refer to Appendix D, *Technical Specifications*).
2. Aim the scanner at the symbol and press the trigger. The scanning beam remains on for approximately 3.0 seconds (default) or until a successful decode.

The scanner has read the symbol when:

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

The green LED stays lit for one second or until the next trigger pull.

## *Aiming*

### Scan the Entire Symbol

- Cross every bar and space of the symbol with the scan beam.
- Hold the scanner further away for larger bar codes.
- Hold the scanner closer for symbols with bars that are close together.


### 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 temporarily "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 still achieve a successful decode Simple practice quickly shows what tolerances to work within.

# Scanning PDF417 (2D) Bar Codes (P300 PRO only)

PDF417 scanning is enabled by default in the P 300PRO scanner, and can be disabled or enabled by scanning the corresponding parameter bar code in *Enable/Disable PDF417* on page 2-85.

To scan a PDF417 bar code:

1. Aim the scanner at the PDF bar code and press the trigger.
2. Hold the trigger down and keep the scan line parallel to the rows of the symbol overlapping the outside edges of the bar code by about 1/2" on each side.

The beam expands vertically to completely cover the bar code.

- Check that PDF417 scanning is enabled.
- Make sure the scan line extends at least 1/2" past the left and right edges of the bar code.

- Hold the scanner closer for denser symbols, farther away for larger symbols.
- Make sure you scan to the top and bottom rows of the symbol.
- Be patient - it may take a few passes to decode the symbol.

The bar code has been completely decoded when you hear a tone, followed by a short, high tone beep. The greed LED on the scanner lights. The green LED stays lit for two seconds or until the next trigger pull.


## Test Symbols

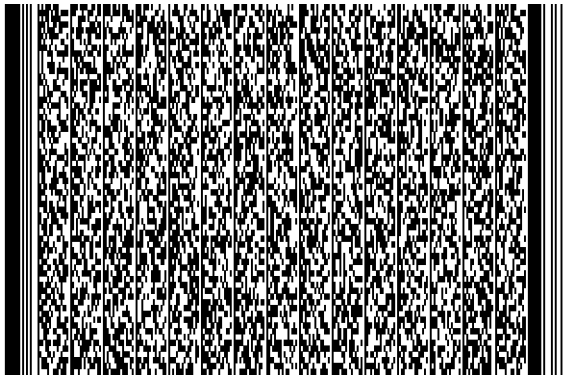
To ensure your scanner is working properly, try scanning the following bar codes. If you have trouble, refer to *Troubleshooting* on page 4-2.


**CODE 128**


**UPC**

**Symbol Technologies, Inc.**

**PDF417**



**"The Gettysburg Address"**

**PDF417**

# Scan Stand Operation

Scan Stand operation allows hands-free scanning on the P 300FZY and P 300PRO. When the scanner is placed in the stand, the scan pattern begins to blink on the surface below. The red LED lights to indicate scanning activity.

To scan, present the symbol in the path of the scan pattern, but no more than 7" away. Make sure the scan pattern extends at 3/4 inch beyond the symbol's edges. When the symbol is properly oriented, the scan pattern expands vertically to cover the symbol. The LED lights green and a short, high-toned beep sounds to indicate successful decode.

After a successful decode, remove the symbol from the scan path. If the symbol does not decode, or if the pattern does not expand, remove the symbol from the scan path and try again. Make sure the bar code is on a clean, white, non-reflective surface.

# Beeper Indications

**Table 1-1. Beeper Indicatio ns**

| Beeper Sequence | Indication |
|---|---|
| **Standard Use** | |
| **Short high tone** | A bar code symbol was decoded (if decode beeper is enabled). |
| **Low tone, followed by short high tone** | A PDF417 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 data is ignored. This occurs if a unit is not properly configured. Check option settings. |
| **5 Beeps - low tone** | Convert or format error. |
| **Low/high/low tone** | ADF transmit error. |
| **High/high/high/low tone** | RS-232 receive error. |
| **Parameter Menu Scanning** | |
| **Short high tone** | Correct entry scanned or correct menu sequence performed. |
| **Low/high tone** | Input error, incorrect bar code or “Cancel” scanned, wrong entry, incorrect bar code programming sequence; remain in program mode. |
| **High/low tone** | Keyboard parameter selected. Enter value using bar code keypad. |
| **High/low/high/low tone** | Successful program exit with change in the parameter setting. |

**Table 1-1. Beeper Indications (Continued)**

| Beeper Sequence | Indication |
|---|---|
| **Code 39 Buffering** | |
| **High/low tone** | New Code 39 data was entered into the buffer. |
| **3 Beeps - long high tone** | Code 39 buffer is full. |
| **Low/high/low tone** | The buffer was erased, or there was an attempt to transmit an empty buffer. When the Code 39 buffer was empty, the scanner read a command to clear or to transmit a Code 39 buffer. |
| **4 Beeps - long low tone** | Error in data transmission. |
| **Low/high tone** | A successful transmission of buffered data. |

## *Macro PDF*

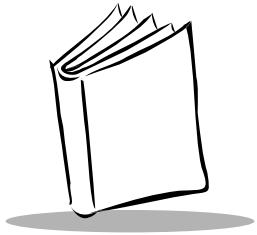
Table 1-2 provides beeper definitions for Macro PDF mode.

**Table 1-2. Macro PDF Beeper Indications**

| Beeper Sequence | Indication |
|---|---|
| Error | |
| 1 Low Long | Hi-level decode error caused by incorrect symbol. |
| 2 Low Long | File ID error. A bar code not in the current MPDF sequence was scanned. |
| 3 Low Long | Out of memory. There is not enough buffer space to store the current MPDF symbol. |
| 4 Low Long | Bad symbology. You scanned a 1-D or 2-D bar code in an MPDF sequence, a duplicate MPDF label, an incorrect sequence, or are trying to transmit an empty or illegal MPDF field. |
| 5 Low Long | Flushing buffer. |
| Fast Warble | Successful parameter scanned. |
| Decode Beep Sequence | |

**Table 1-2. Macro PDF Beeper Indications**

| Beeper Sequence | Indication |
|---|---|
| Single short | Standard decode and transmit beep for all symbols. |
| Double short | MPDF symbol is buffered. A single beep indicates transmission of the buffered data. |



# *Chapter 2*
# *Programming the Scanner*

## Introduction

The P 300 Series scanner can be programmed to perform various functions, or activate different features. This chapter describes each feature and provides the programming bar codes necessary for selecting these features for your scanner. Before programming, follow the setup instructions in Chapter 1, *Getting Started*.

The P 300 Series scanner is shipped with the default settings shown in Table 2-1. You can change these default values by scanning the appropriate bar codes included in this chapter. These new values replace the standard default values in memory and are preserved even when the scanner is powered down. The default parameter values can be recalled by scanning the *Set All Defaults* bar code on page 2-9.

Even if the default parameters suit your needs, you must still select a terminal type. The scanner automatically identifies the host type on power-up. It makes this determination provided the host is powered-up before the scanner is attached to it. You must then select the appropriate terminal type for that host.

The following table lists the defaults for all parameters. If you wish to change any option, scan the appropriate bar code(s). Several of the bar code parameters apply only to the P300FZY, and others apply only to the P300PRO. This is noted in the parameter menus.

**Table 2-1. Default Table**

| Parameter | P300FZY Default | P 300PRO Default | Page # |
|---|---|---|---|
| Set Default Parameter | All Defaults | All Defaults | 2-9 |
| Host Type | RS-232 | RS-232 | 2-12 |
| Beeper Volume | High | N/A | 2-13 |
| Beeper Tone | Medium | High | 2-14 |
| Laser On Time | 3.0 seconds | 5.0 seconds | 2-15 |
| Power Mode | Continuous | Continuous | 2-16 |
| Trigger Mode | N/A | Level | 2-17 |
| Beep After Good Decode | Enable | Enable | 2-18 |
| Transmit “No Read” Message | Disable | Disable | 2-19 |
| Decode Buffering | N/A | Enable | 2-19 |
| LRC Checksum | Disable | Disable | 2-20 |
| Linear Code Type Security Levels | 1 | 2 | 2-21 |
| Bi-directional Redundancy | Disable | Disable | 2-23 |
| Autodiscriminate Response Time | 1.0 second | N/A | 2-24 |
| SCAN STAND OPTIONS | | | |
| Time Delay to Low Power Mode | N/A | 30 seconds | 2-25 |
| Time Out Between Same Symbols | N/A | 0.6 seconds | 2-26 |
| Time Out Between Different Symbols | N/A | 0.0 seconds | 2-26 |
| UPC/EAN | | | |
| UPC-A | Enable | Enable | 2-28 |

**Table 2-1. Default Table (continued)**

| Parameter | P300FZY Default | P 300PRO Default | Page # |
|---|---|---|---|
| UPC-E | Enable | Enable | 2-28 |
| UPC-E1 | Disable | Disable | 2-29 |
| EAN-8 | Enable | Enable | 2-30 |
| EAN-13 | Enable | Enable | 2-30 |
| UPC Coupon Code | Disable | N/A | 2-31 |
| Bookland EAN | Disable | Disable | 2-32 |
| Decode UPC/EAN Supplementals | Ignore | Ignore | 2-33 |
| Decode UPC/EAN Supplemental Redundancy | 7 | 7 | 2-34 |
| Transmit UPC-A Check Digit | Enable | Enable | 2-35 |
| Transmit UPC-E Check Digit | Enable | Enable | 2-35 |
| UPC-A Preamble | System Character | System Character | 2-36 |
| UPC-E Preamble | System Character | System Character | 2-37 |
| UPC-E1 Preamble | System Character | System Character | 2-38 |
| Convert UPC-E to A | Disable | Disable | 2-39 |
| Convert UPC-E1 to UPC-A | Disable | Disable | 2-40 |
| Transmit UPC-E1 Check Digit | Enabled | Enable | 2-41 |
| UPC/EAN Security Levels | 0 | 0 | 2-42 |
| EAN-8 Zero Extend | Disable | Disable | 2-44 |
| Convert EAN-8 to EAN-13 Type | Disable | Disable | 2-45 |

**Table 2-1. Default Table (continued)**

| Parameter | P300FZY Default | P 300PRO Default | Page # |
|---|---|---|---|
| Code 128 | | | |
| Code 128 | Enable | Enable | 2-46 |
| UCC/EAN-128 | Enable | Enable | 2-47 |
| ISBT-128 | Enable | Enable | 2-48 |
| Code 39 | | | |
| Code 39 | Enable | Enable | 2-50 |
| Trioptic Code 39 | Disable | Disable | 2-51 |
| Set Length(s) for Code 39 | 2 to 55 | 1-55 | 2-53 |
| Code 39 Check Digit Verification | Disable | Disable | 2-54 |
| Transmit Code 39 Check Digit | Disable | Disable | 2-55 |
| Code 39 Full ASCII Conversion | Disable | Disable | 2-56 |
| Buffer Code 39 | Disable | N/A | 2-57 |
| Convert Code 39 to Code 32 | Disable | Disable | 2-60 |
| Code 32 Prefix | Disable | Enabled | 2-61 |
| Code 93 | | | |
| Code 93 | Disable | Disable | 2-62 |
| Set Length(s) for Code 93 | 4-55 | 4-55 | 2-63 |
| Interleaved 2 of 5 | | | |
| Interleaved 2 of 5 | Enable | Disable | 2-65 |
| Set Length(s) for I 2 of 5 | 14 | 14 | 2-66 |
| I 2 of 5 Check Digit Verification | Disable | Disable | 2-68 |

**Table 2-1. Default Table (continued)**

| Parameter | P300FZY Default | P 300PRO Default | Page # |
|---|---|---|---|
| Transmit I 2 of 5 Check Digit | Disable | Disable | 2-69 |
| Convert I 2 of 5 to EAN 13 | Disable | Disable | 2-70 |
| Discrete 2 of 5 | | | |
| Discrete 2 of 5 | Disable | Disable | 2-71 |
| Set Length(s) for D 2 of 5 | 12 | 12 | 2-72 |
| Codabar | | | |
| Codabar | Disable | Disable | 2-74 |
| Set Lengths for Codabar | 5-55 | 5-55 | 2-75 |
| CLSI Editing | Disable | Disable | 2-77 |
| NOTIS Editing | Disable | Disable | 2-78 |
| MSI Plessey | | | |
| MSI Plessey | Disable | Disable | 2-79 |
| Set Length(s) for MSI Plessey | Any Length | Any Length | 2-81 |
| MSI Plessey Check Digits | One | One | 2-82 |
| Transmit MSI Plessey Check Digit | Disable | Disable | 2-83 |
| MSI Plessey Check Digit Algorithm | Mod 10/Mod 10 | Mod10/Mod10 | 2-84 |
| PDF | | | |
| Enable/Disable PDF417 | N/A | Enable | 2-85 |
| Scanning Mode | N/A | Smart Raster | 2-89 |
| Raster Height | N/A | 15 | 2-90 |
| Raster Expansion | N/A | 11 | 2-90 |

**Table 2-1. Default Table (continued)**

| Parameter | P300FZY Default | P 300PRO Default | Page # |
|---|---|---|---|
| Aiming Mode | N/A | Slab Raster | 2-92 |
| Micro PDF | | | |
| Enable/Disable Micro PDF | N/A | Disable | 2-86 |
| Code 128 Emulation | N/A | Enable | 2-87 |
| UCC/EAN-128 Emulation | N/A | Ignore | 2-88 |
| Data Options | | | |
| Transmit Code ID Character | None | None | 2-94 |
| Pause Duration | 0 | 0 | 2-95 |
| Prefix/Suffix Values | 7013 (<CR/LF> for serial) | Enter | 2-96 |
| Scan Data Transmission Format | Data as is | Data As Is | 2-97 |
| RS-232C | | | |
| RS-232 Host Type | Standard | Standard | 2-12 |
| Baud Rate | 9600 | 9600 | 2-100 |
| Parity | None | None | 2-101 |
| Check Parity | Do Not Check | Check | 2-102 |
| Hardware Handshaking | None | None | 2-103 |
| Software Handshaking | None | None | 2-104 |
| Host Serial Response Time-out | 2.0 Sec. | 2.0 Sec. | 2-106 |
| RTS Line State | Low | Low | 2-107 |
| Stop Bit Select | 1 | 1 | 2-107 |

**Table 2-1. Default Table (continued)**

| Parameter | P300FZY Default | P 300PRO Default | Page # |
|---|---|---|---|
| ASCII Format | 8-Bit | 8-Bit | 2-108 |
| Beep on <BEL> | Disable | Disable | 2-108 |
| Intercharacter Delay | 0 | 0 | 2-109 |
| Wand Parameters | | | |
| Wand Host Interface | Symbollink | N/A | 2-110 |
| Wand Emulator Bar Output | Bar High | N/A | 2-111 |
| Variable Leading Margin | 80 ms. | N/A | 2-112 |
| Convert All to Code 39 | Disable | N/A | 2-114 |
| Keyboard Wedge Parameters | | | |
| Host Type | IBM PC/AT | N/A | 2-115 |
| National Keyboard Type | North American | N/A | 2-116 |
| Fast Transmit | Enabled | N/A | 2-118 |
| Intercharacter Delay | 0 | N/A | 2-119 |
| Convert Control Characters | Disable | N/A | 2-119 |
| MacroPDF Parameters | | | |
| MacroPDF Transmit/Decode Mode Symbols | N/A | Buffer all Symbols; Transmit Macro PDF when complete | 2-124 |
| Transmit Symbols in Codeword Format | N/A | Disable | 2-126 |
| Escape Characters | N/A | None | 2-128 |
| Delete Character Set ECIs | N/A | Enable | 2-129 |

**Table 2-1. Default Table (continued)**

| Parameter | P300FZY Default | P 300PRO Default | Page # |
|---|---|---|---|
| ECI Decoder | N/A | Enable | 2-130 |
| Transmit Unknown Codewords | N/A | Disable | 2-131 |
| Transmit MacroPDF User-Selectable Fields | N/A | Disable | 2-132 |
| Flush Macro Buffer | N/A | Disable | 2-135 |
| Abort MacroPDF Entry | N/A | Disable | 2-135 |
| Transmit Macro PDF User-Selected Field: | | | |
| Transmit File Name | N/A | Disable | 2-133 |
| Transmit Block Count | N/A | Disable | 2-133 |
| Transmit Time Stamp | N/A | Disable | 2-133 |
| Transmit Sender | N/A | Disable | 2-133 |
| Transmit Addresses | N/A | Disable | 2-134 |
| Transmit File Size | N/A | Disable | 2-134 |
| Transmit Checksum | N/A | Disable | 2-134 |
| Transmit Macro PDF Control Header | N/A | Disable | 2-134 |
| Last Block Marker | N/A | Disable | 2-134 |

# Set Default Parameter

Scanning this bar code returns all parameters to the default values listed in Table 2-1 on page 2-2.

**Set All Defaults**

# Host Type

## *RS-232C Host Types*

Three RS-232C hosts are set up with their own parameter default settings (Table 2-2.) Selecting the ICL, Fujitsu, or Nixdorf RS-232C terminal sets the defaults listed below. These defaults take precedence over standard defaults. So if you select Fujitsu RS-232C, then select the standard defaults, the Fujitsu defaults still take precedence.

**Table 2-2. Terminal-Specific RS-232C**

| Parameter | Standard | ICL | FUJITSU | NIXDORF Mode A/ Mode B |
|---|---|---|---|---|
| Transmit Code ID | No | Yes | Yes | Yes |
| Data Transmission Format | Data as is | Data/Suffix | Data/Suffix | Data/Suffix |
| Suffix | CR/LF (7013) | CR (1013) | CR (1013) | CR (1013) |
| Baud Rate | 9600 | 9600 | 9600 | 9600 |
| Parity | None | Even | None | Odd |
| Hardware Handshaking | None | RTS/CTS Option 3 | None | RTS/CTS Option 3 |
| Software Handshaking | None | None | None | None |
| Serial Response Time-out | 2 Sec. | 9.9 Sec. | 2 Sec. | indefinite |
| Stop Bit Select | One | One | One | One |
| ASCII Format | 8-Bit | 8-Bit | 8-Bit | 8-Bit |
| Beep On <BEL> | Disabled | Disabled | Disabled | Disabled |
| RTS Line State | Low | High | Low | *Low = No data to send |

*In the Nixdorf Mode B, if CTS is Low, scanning is disabled. When CTS is High, the user can scan bar codes.

# Host Type

## RS-232C Host Types

Selecting the ICL, Fujitsu, or Nixdorf RS-232C terminal enables the transmission of the code ID characters listed in Table 2-3. These code ID characters are not programmable; do not enable the Transmit Code ID feature.

**Table 2-3.Terminal Specific Code ID Characters**

| | ICL | FUJITSU | NIXDORF |
|---|---|---|---|
| UPC-A | A | A | A |
| UPC-E | E | E | C0 |
| EAN-8 | FF | FF | B |
| EAN-13 | F | F | A |
| Code 39 | C <len> | None | M |
| Codabar | N <len> | None | N |
| Code 128 | L <len> | None | K |
| I 2 of 5 | I <len> | None | I |
| Code 93 | None | None | L |
| D 2 of 5 | H <len> | None | H |
| UCC/EAN 128 | L <len> | None | P |
| MSI/Plessey | None | None | O |
| Bookland EAN | F | F | A |
| Trioptic | None | None | None |

# Host Type

## *RS-232C Host Types*

To select an RS-232C host interface, scan one of the following bar codes.

**Standard RS-232C**

**ICL RS-232C**

**Nixdorf RS-232C Mode A**

**Nixdorf RS-232C Mode B**

**Fujitsu RS-232C**

# Beeper Volume

To select a beeper volume, scan the **Low Volume, Medium Volume,** or **High Volume** bar code.

**Low Volume**

**Medium Volume**

**High Volume**

# Beeper Tone

This parameter sets the decode beep frequency or tone — low, medium, or high.

**Note:** *This parameter is used by the P300 FZY and PRO only*

**Low Frequency**

**Medium Frequency**

**High Frequency**

# Laser On Time

This parameter sets the maximum time decode processing continues during a scan attempt. It is programmable in 0.1 second increments from 0.5 to 9.9 seconds.

To set a Laser On Time, scan the bar code below. Next scan two numeric bar codes beginning on page 2-120 that correspond to the desired time on. Single digit numbers must have a leading zero. For example, to set a Time On of .5 seconds, scan the bar code below, then scan the "0" and "5" bar codes. If you make an error, or wish to change your selection, scan **CANCEL** on page 2-122.

**Laser On Time**

# Power Mode

This parameter determines whether or not power remains on after a decode attempt. When in low power mode, the scanner enters low power consumption mode to preserve battery life after each decode attempt. When in continuous power mode, power remains on after each decode attempt.

**Continuous On**

**Low Power**

# Trigger Mode

This parameter controls scanner triggering. “Trigger” refers to an external hardware trigger or a scanner trigger.

**Note:** *This parameter is available on the P 300PRO only.*

- If Level is selected, a trigger pull activates the laser and decode processing. The laser remains on and decode processing continues until a successful decode, the trigger is released, or the Decode Attempt Duration is reached.
- If Pulse is selected, a trigger pull activates the laser and decode processing. The laser remains on and decode processing continues until a successful decode or the Decode Attempt Duration is reached.

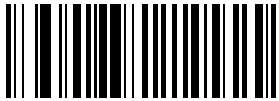
Select either Level or Pulse trigger mode.

**Level**

**Pulse**

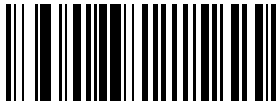
# Beep After Good Decode

Scan this symbol if you want the scanner to beep after a good decode.



**Beep After Good Decode**

Scan this symbol if you do not want the scanner to beep after a good decode. The beeper still operates during parameter menu scanning and indicates error conditions.



**Do Not Beep After Good Decode**

## Transmit "No Read" Message

When enabled, the scanner transmits "NR" if it does not decode a symbol. Any enabled prefixes or suffixes are appended around this message. When disabled, if a symbol does not read, nothing is sent to the host.

**Enable No Read**

**Disable No Read**

## Decode Buffering

This option permits the scanner to store decode data until the host device is ready to receive them. If the scanner reaches its capacity to store decoded symbols before the host is ready, subsequent trigger pulls have no effect until a buffer is available.

**Enable Decode Buffering**

**Disable Decode Buffering**

# LRC Checksum

Enabling this option allows for appending an LRC checksum character at the end of a decode transmission.

When an LRC checksum is enabled, the format of output data is as follows: <STX> <DATA...> <ETX> <LRC>. If <DATA...> contains the special characters STX, ETX, and DLE, a DLE character is used as an escape character and is added before each of those characters so that the receiving side knows not to interpret the special characters in the data as control characters. The LRC character is the exclusive OR of all characters except for the LRC character itself.

**Enable LRC Checksum**

**Disable LRC Checksum**

# Linear Code Type Security Level

## *(Does not apply to Code 128)*

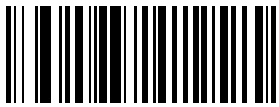
The P 300 Series scanner offers four levels of decode security for linear code types (e.g. Code 39, Interleaved 2 of 5). Select a higher security level for low quality bar codes. As security levels increase, the scanner's aggressiveness decreases.

Select the security level appropriate for your bar code quality.

## *Linear Security Level 1*

The following code types must be successfully read twice before being transmitted.

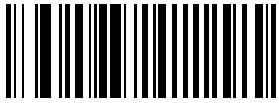
| Code Type | Length |
|---|---|
| Codabar | All |
| MSI Plessey | 4 or less |
| D 2 of 5 | 8 or less |
| I 2 of 5 | 8 or less |



**Linear Security Level 1**

## *Linear Security Level 2*

All code types must be successfully read twice before being transmitted.

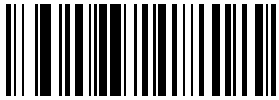


**Linear Security Level 2**

## Linear Security Level 3

Code types other than the following must be successfully read twice before being transmitted. The following codes must be read three times:

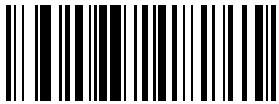
| Code Type | Length |
|---|---|
| MSI Plessey | 4 or less |
| D 2 of 5 | 8 or less |
| I 2 of 5 | 8 or less |
| Codabar | 8 or less |



**Linear Security Level 3**

## Linear Security Level 4

All code types must be successfully read three times before being transmitted



**Linear Security Level 4**

# Bi-directional Redundancy

This parameter is only valid when a *Linear Code Type Security Level* (see page 2-21) is enabled. When this parameter is enabled, a bar code must be successfully scanned in both directions (forward and reverse) before being decoded.

**Enable Bi-directional Redundancy**

**Disable Bi-directional Redundancy**

# Autodiscriminate Response Time

This parameter extends the length of time during which the scanner tries to detect which host it is connected to on power up.

**Note:** *When connected to an LS 5700/5800 scanner, the 5 second option must be used.*

**1 second**

**5 seconds**

# Scan Stand Options

## *Time Delay to Low Power Mode*

**Note:** *This parameter is available on the P 300PRO only.*

For extending laser life in scan stand mode, select the time the scanner remains active following a successful decode. Selectable options include 30 seconds, 1 minute, 2 minutes, 3 minutes. To awaken the scanner in low power mode, present a symbol to the scan path. A successful decode restores it to normal blinking.

**30 Second Delay**

**1 Minute Delay**

**2 Minute Delay**

**3 Minute Delay**

## *Timeout Between Decodes*

**Note:** *This parameter is available on the P 300PRO only.*

Timeout Between Decodes, Same Symbol is used in scan stand mode to prevent the beeper from continuously beeping when a symbol is left in the scanner's field of view. It is programmable in 0.1 second increments from 0.0 to 9.9 seconds. The recommended interval is 0.6 seconds.

Timeout Between Decodes, Different Symbols is used in scan stand mode to prevent the beeper from beeping when a different symbol appears in the scanner's field of view before the timeout period between decodes has expired. This is programmable in 0.1 second increments from 0.0 to 9.9 seconds. The recommended value is 0.0 seconds.

Select the timeouts between decodes for the same or different symbols.

1. Scan the option bar code you wish to set.
2. Scan two bar codes on the next page which correspond to the desired interval, in 0.1 second increments.
3. If you make an error, or wish to change your selection, scan CANCEL.

**Timeout Between Decodes - The Same Symbol**

**Timeout Between Decodes - Different Symbols**

## *Timeout Between Decodes (Continued)*

**0**

**1**

**2**

**3**

**4**

**5**

**6**

**7**

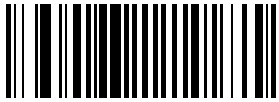
**8**

**9**

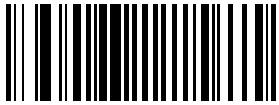
**Cancel**

# Enable/Disable UPC-E/UPC-A

To enable or disable UPC-E or UPC-A, scan the appropriate bar code below.

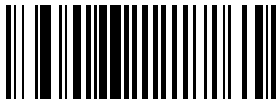


**Enable UPC-E**



**Disable UPC-E**

**Enable UPC-A**



**Disable UPC-A**

# Enable/Disable UPC-E1

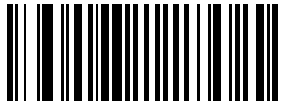
To enable or disable UPC-E1, scan the appropriate bar code below.

**Enable UPC-E1**

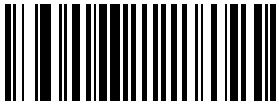
**Disable UPC-E1**

# Enable/Disable EAN-8/EAN-13

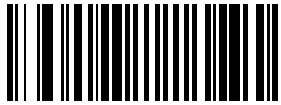
To enable or disable EAN-8 or EAN-13, scan the appropriate bar code below.



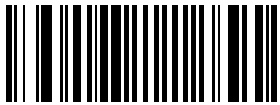
**Enable EAN-8**



**Disable EAN-8**



**Enable EAN-13**



**Disable EAN-13**

# UPC Coupon Code

To enable or disable UPC Coupon Code, scan one of the following bar codes:

**Enable UPC/EAN Coupon Code**

**Disable UPC/EAN Coupon Code**

# Enable/Disable Bookland EAN

To enable or disable EAN Bookland, scan the appropriate bar code below.

**Enable Bookland EAN**

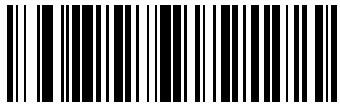
**Disable Bookland EAN**

# Decode UPC/EAN Supplementals

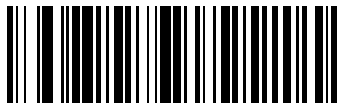
Supplementals are additionally appended characters (2 or 5) according to specific code format conventions (e.g., UPC A+2, UPC E+2, EAN 8+2). Three options are available.

- If UPC/EAN with supplemental characters is selected, UPC/EAN symbols without supplemental characters are not decoded.
- If UPC/EAN without supplemental characters is selected, and the P 300 Series scanner is presented with a UPC/EAN plus supplemental symbol, the UPC/EAN is decoded and the supplemental characters ignored.
- An autodiscriminate option is also available. If this option is selected, choose an appropriate *Decode UPC/EAN Supplemental Redundancy* value from the next page. A value of 5 or more is recommended.

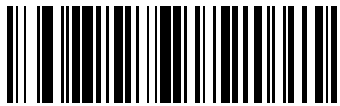
**Note:** *To minimize the risk of invalid data transmission, select whether to read or ignore supplemental characters.*



**Decode UPC/EAN with Supplementals**



**Ignore UPC/EAN with Supplementals**



**Autodiscriminate UPC/EAN Supplemental**

# Decode UPC/EAN Supplemental Redundancy

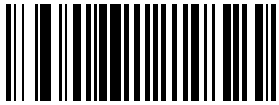
With Autodiscriminate UPC/EAN Supplementals selected, this option adjusts the number of times a symbol without supplementals is decoded before transmission. The range is from two to twenty times. Five or above is recommended when decoding a mix of UPC/EAN symbols with and without supplementals, and the autodiscriminate option is selected.

Scan the bar code below to select a decode redundancy value. Next scan two numeric bar codes beginning on page 2-120. Single digit numbers must have a leading zero. If you make an error, or wish to change your selection, scan **CANCEL** on page 2-122.

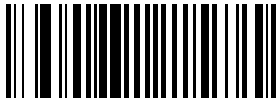
**Decode UPC/EAN Supplemental Redundancy**

# Transmit UPC-A/UPC-E Check Digit

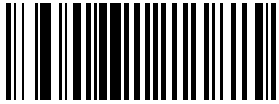
Scan the appropriate bar code below to transmit the symbol with or without the UPC-A or UPC-E check digit.



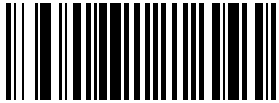
**Transmit UPC-A Check Digit**



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



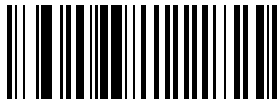
**Transmit UPC-E Check Digit**



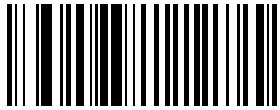
**Do Not Transmit UPC-E Check Digit**

# UPC-A Preamble

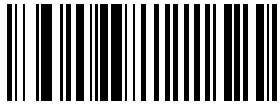
Three options are given for lead-in characters for UPC-A symbols transmitted to the host device: transmit system character only, transmit system character and country code (“0” for USA), and no preamble transmitted. The lead-in characters are considered part of the symbol.



**No Preamble**
**(<DATA>)**



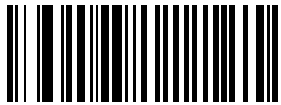
**System Character**
**(<SYSTEM CHARACTER> <DATA>)**



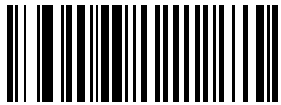
**System Character & Country Code**
**(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)**

# UPC-E Preamble

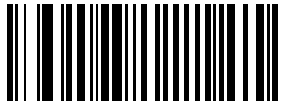
Three options are given for lead-in characters for UPC-E symbols transmitted to the host device: transmit system character only, transmit system character and country code ("0" for USA), and no preamble transmitted. The lead-in characters are considered part of the symbol.



**No Preamble**
**(<DATA>)**



**System Character**
**(<SYSTEM CHARACTER> <DATA>)**



**System Character & Country Code**
**(< COUNTRY CODE> <SYSTEM CHARACTER> <DATA>)**

# UPC-E1 Preamble

Three options are given for lead-in characters for UPC-E1 symbols transmitted to the host device: transmit system character only, transmit system character and country code (“0” for USA), and no preamble transmitted. The lead-in characters are considered part of the symbol.

**No Preamble**

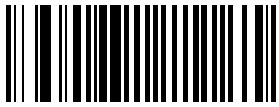
**System Character**

**System Character and Country Code**

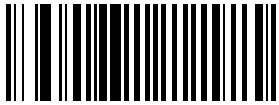
# Convert UPC-E to UPC-A

This parameter converts UPC-E (zero suppressed) decoded 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).

Scanning **DO NOT CONVERT UPC-E TO UPC-A** allows you to transmit UPC-E (zero suppressed) decoded data.



**Convert UPC-E to UPC-A (Enable)**



**Do Not Convert UPC-E to UPC-A (Disable)**

# Convert UPC-E1 to UPC-A

This parameter converts UPC-E1 decoded 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).

Scanning **DO NOT CONVERT UPC-E1 TO UPC-A** allows you to transmit UPC-E1 decoded data.

**Convert UPC-E1 to UPC-A**

**Do Not Convert UPC-E1 to UPC-A**

# Transmit UPC-E1 Check Digit

Scan the appropriate bar code below to transmit the symbol with or without the UPC-E1 check digit

**Transmit UPC-E1 Check Digit**

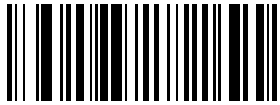
**Do Not Transmit UPC-E1 Check Digit**

# UPC/EAN Security Level

The P 300 Series scanner offers four levels of decode security for UPC/EAN bar codes. Select a higher level of security for poor quality bar codes. There is an inverse relationship between security and scanner aggressiveness, so be sure to choose only that level of security necessary for your application.

## *UPC/EAN Security Level 0*

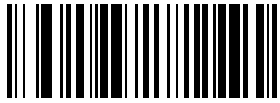
This default setting allows the scanner to operate in its most aggressive state, while providing sufficient security in decoding "in-spec" UPC/EAN bar codes.



**UPC/EAN Security Level 0**

## *UPC/EAN Security Level 1*

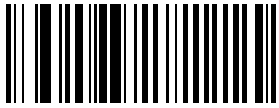
As bar code quality levels diminish, certain characters become prone to misdecodes before others (i.e., 1, 2, 7, 8). If you are experiencing misdecodes of poorly printed bar codes, and the mis-decodes are limited to these characters, select this security level.



**UPC/EAN Security Level 1**

## *UPC/EAN Security Level 2*

If you are experiencing misdecodes of poorly printed bar codes, and the misdecodes are not limited to characters 1, 2, 7, and 8, select this security level.



**UPC/EAN Security Level 2**

## *UPC/EAN Security Level 3*

If you have tried Security Level 2, and are still experiencing misdecodes, select this security level. Be advised, selecting this option is an extreme measure against misdecoding severely out of spec bar codes, and security significantly impairs the decoding ability of the scanner. If this level of security is necessary, try to improve the quality of your bar codes.

**UPC/EAN Security Level 3**

# EAN-8 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-8 Zero Extend**

**Disable EAN-8 Zero Extend**

# Convert EAN-8 to EAN-13 Type

When EAN Zero Extend is enabled, this parameter gives you the option of labeling the extended symbol as either an EAN-13 bar code, or an EAN-8 bar code. This affects *Transmit Code ID Character* and *DECODE_DATA* message.

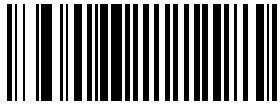
When EAN Zero Extend is disabled, this parameter has no effect on bar code data.

**Type Is EAN-8**

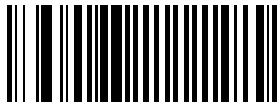
**Type Is EAN-13**

# Enable/Disable Code 128

To enable or disable Code 128, scan the appropriate bar code below.



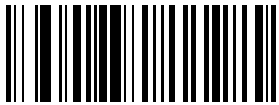
**Enable Code 128**



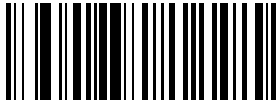
**Disable Code 128**

# Enable/Disable UCC/EAN-128

To enable or disable UCC/EAN-128, scan the appropriate bar code below. (See Appendix A, *Programming Reference* for details on UCC/EAN128.)



**Enable UCC/EAN-128**



**Disable UCC/EAN-128**

# Enable/Disable ISBT 128

To enable or disable ISBT 128, scan the appropriate bar code below.

**Enable ISBT 128**

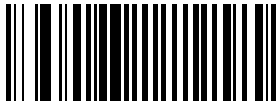
**Disable ISBT 128**

# Lengths for Code 128

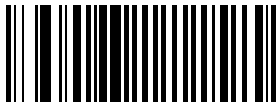
No length setting is required for Code 128. The default setting is Any Length.

# Enable/Disable Code 39

To enable or disable Code 39, scan the appropriate bar code below.



**Enable Code 39**



**Disable Code 39**

# Enable/Disable Trioptic Code 39

Trioptic Code 39 symbols always contain six characters. To enable or disable Trioptic Code 39, scan the appropriate bar code below.

**Enable Trioptic Code 39**

**Disable Trioptic Code 39**

**Note:** *Trioptic Code 39 and Code 39 Full ASCII cannot be enabled simultaneously. If you get an error beep when enabling Trioptic Code 39, disable Code 39 Full ASCII and try again.*

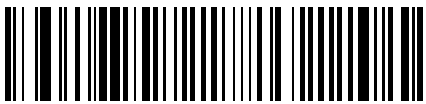
# Set Lengths for Code 39

Lengths for Code 39 may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters), the code contains, including check digit(s) . If Code 39 Full ASCII is enabled, **Length Within a Range** or **Any Length** are the preferred options.

**One Discrete Length** - This option allows you to decode only those codes containing a selected length. For example, if you select **Code 39 One Discrete Length**, then scan **1**, **4**, only Code 39 symbols containing 14 characters are decoded. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**Code 39 - One Discrete Length**

**Two Discrete Lengths** - This option allows you to decode only those codes containing two selected lengths. For example, if you select **Code 39 Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, only Code 39 symbols containing 2 or 14 characters are decoded. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.



**Code 39 -Two Discrete Lengths**

**Length Within Range** - This option allows you to decode a code type within a specified range. For example, to decode Code 39 symbols containing between 4 and 12 characters, first scan **Code 39 Length Within Range**. Then scan **0**, **4**, **1**, and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**Code 39 - Length within Range**

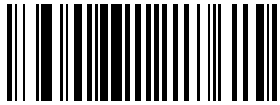
**Any Length** - Scanning this option allows you to decode Code 39 symbols containing any number of characters.

**Code 39 - Any Length**

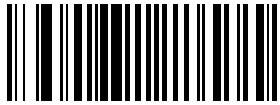
# Code 39 Check Digit Verification

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

Only those Code 39 symbols which include a modulo 43 check digit are decoded when this parameter is enabled.



**Enable Code 39 Check Digit**



**Disable Code 39 Check Digit**

# Transmit Code 39 Check Digit

Scan this symbol if you want to transmit the check digit with the data.

**Transmit Code 39 Check Digit (Enable)**

**Do Not Transmit Code 39 Check Digit (Disable)**

# Enable/Disable Code 39 Full ASCII

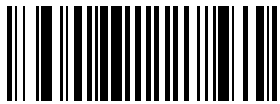
To enable or disable Code 39 Full ASCII, scan the appropriate bar code below.

When enabled, the ASCII character set assigns a code to letters, punctuation marks, numerals, and most control keystrokes on the keyboard.

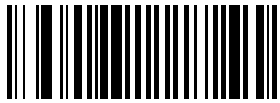
The first 32 codes are non-printable and are assigned to keyboard control characters such as BACKSPACE and RETURN. The other 96 are called printable codes because all but SPACE and DELETE produce visible characters.

Code 39 Full ASCII interprets the bar code special character ($ + % /) preceding a Code 39 character and assigns an ASCII character value to the pair. For example, when Code 39 Full ASCII is enabled and a **+B** is scanned, it is interpreted as **b**, **%J** as **?**, and **$H** emulates the keystroke **BACKSPACE**. Scanning **ABC$M** outputs the keystroke equivalent of **ABC ENTER**. Refer to Table C-1 on page C-1.

The scanner does not autodiscriminate between Code 39 and Code 39 Full ASCII.



**Enable Code 39 Full ASCII**



**Disable Code 39 Full ASCII**

**Note:** *Trioptic Code 39 and Code 39 Full ASCII cannot be enabled simultaneously. If you get an error beep when enabling Trioptic Code 39, disable Code 39 Full ASCII and try again.*

# Code 39 Buffering (Scan & Store)

When you select the Buffer Code 39 option, all Code 39 symbols having a leading space as a first character are temporarily buffered in the unit to be transmitted later. The leading space is not buffered.

Decode of a valid Code 39 symbol with no leading space causes transmission in sequence of all buffered data in a first-in first-out format, plus transmission of the "triggering" symbol. See the following pages for further details.

When the Do Not Buffer Code 39 option is selected, decoded Code 39 symbols without leading spaces are transmitted immediately.

Scan and Store affects Code 39 decodes only. If you select scan and store, we recommend that you configure the scanner to decode Code 39 symbology only.

**Buffer Code 39**
**(Enable)**

**Do Not Buffer Code 39**
**(Disable)**

While there is data in the transmission buffer, disabling Code 39 buffering via the parameter menu is not allowed. The buffer holds 200 bytes of information.

To allow disabling of Code 39 buffering, first force the buffer transmission (see *Transmit Buffer*) or clear the buffer. Both the **CLEAR BUFFER** and **TRANSMIT BUFFER** bar codes are length 1. *Be sure Code 39 length is set to include length 1.*

## Buffer Data

To buffer data, Code 39 buffering must be enabled, and a symbol must be read with a space immediately following the start pattern.

- Unless symbol overflows the transmission buffer, the scanner gives a low/high beep to indicate successful decode and buffering. See *Overfilling Transmission Buffer*.
- The scanner adds the message, excluding the leading space, to the transmission buffer.
- No transmission occurs.

## Clear Transmission Buffer

To clear the transmission buffer, read a symbol which contains only a start character, a dash (minus), and a stop character.

- The scanner issues a short high/low/high beep to signal that the transmission buffer has been erased, and no transmission has occurred.
- The scanner erases the transmission buffer.
- No transmission occurs.

**Clear Buffer**

## Transmit Buffer

To transmit the buffer, read a symbol containing either the first or second condition:

1. Only a start character, a plus (+), and a stop character.
   - The scanner signals that the transmission buffer has been sent (a low/high beep).
   - The scanner sends the buffer.
   - The scanner clears the buffer.

**Transmit Buffer**

2. A Code 39 bar code with a leading character other than a space.
   - The scanner signals a good decode and buffering of that decode has occurred by giving a high/low beep.
   - The scanner transmits the buffer.
   - The scanner signals that the buffer has been transmitted with a low/high beep.

## Overfilling Transmission Buffer

If a decoded symbol results in an overflow of the transmission buffer:

- The scanner indicates that the symbol has been rejected by issuing three long, high beeps.
- No transmission occurs. Data in the buffer is not affected.

## Attempt to Transmit an Empty Buffer

If a decoded symbol was the transmit buffer symbol and the Code 39 buffer is empty:

- A short low/high/low beep signals that the buffer is empty.
- No transmission occurs.
- The buffer remains empty.

# Convert Code 39 to Code 32

Scan the appropriate bar code below to enable or disable converting Code 39 to Code 32.

**Note:** *Code 39 must be enabled in order for this parameter to function.*

**Convert Code 39 to Code 32**

**Do Not Convert Code 39 to Code 32**

# Enable/Disable Code 32 Prefix

Scan the appropriate bar code below to enable or disable adding the prefix character "A" to all Code 32 bar codes.

**Note:** *Convert Code 39 to Code 32 must be enabled for this parameter to function.*

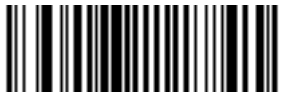
**Code 32 Prefix Enable**

**Code 32 Prefix Disable**

# Enable/Disable Code 93

To enable or disable Code 93, scan the appropriate bar code below.

**Enable Code 93**



**Disable Code 93**

# Set Lengths for Code 93

Lengths for Code 93 may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters), including check digit(s) the code contains.

**One Discrete Length** - This option allows you to decode only those codes containing a selected length. For example, if you select **Code 93 One Discrete Length**, then scan **1**, **4**, only Code 93 symbols containing 14 characters are decoded. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**Code 93 - One Discrete Length**

**Two Discrete Lengths** - This option allows you to decode only those codes containing two selected lengths. For example, if you select **Code 93 Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, only Code 93 symbols containing 2 or 14 characters are decoded. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**Code 93 -Two Discrete Lengths**

**Length Within Range** - This option allows you to decode a code type within a specified range. For example, to decode Code 93 symbols containing between 4 and 12 characters, first scan **Code 93 Length Within Range**. Then scan **0**, **4**, **1,** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

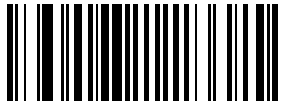
**Code 93 - Length within Range**

**Any Length** - Scanning this option allows you to decode Code 93 symbols containing any number of characters.

**Code 93 - Any Length**

# Enable/Disable Interleaved 2 of 5

To enable or disable Interleaved 2 of 5, scan the appropriate bar code below.



**Enable Interleaved 2 of 5**

**Disable Interleaved 2 of 5**

# Set Lengths for Interleaved 2 of 5

Lengths for I 2 of 5 may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters) the code contains, and includes check digits.

**One Discrete Length** - This option allows you to decode only those codes containing a selected length. For example, if you select **I 2 of 5 One Discrete Length**, then scan **1**, **4**, the only I 2 of 5 symbols decoded are those containing 14 characters. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**I 2 of 5 - One Discrete Length**

**Two Discrete Lengths** - This option allows you to decode only those codes containing two selected lengths. For example, if you select **I 2 of 5 Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, the only I 2 of 5 symbols decoded are those containing 2 or 14 characters. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**I 2 of 5 - Two Discrete Lengths**

**Length Within Range** - This option allows you to decode a code type within a specified range. For example, to decode I 2 of 5 symbols containing between 4 and 12 characters, first scan **I 2 of 5 Length Within Range**. Then scan **0**, **4**, **1,** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**I 2 of 5 - Length within Range**

**Any Length** - Scanning this option allows you to decode I 2 of 5 symbols containing any number of characters.

---

**Note:** *Selecting this option may lead to misdecodes for I 2 of 5 codes.*

---

**I 2 of 5 - Any Length**

# I 2 of 5 Check Digit Verification

When enabled, this parameter checks the integrity of an I 2 of 5 symbol to ensure it complies a specified algorithm, either Uniform Symbology Specification (USS ), or Optical Product Code Council (OPCC).

**Disable**

**USS Check Digit**

**OPCC Check Digit**

# Transmit I 2 of 5 Check Digit

Scan a symbol below to transmit the data with or without the check digit.

**Transmit I 2 of 5 Check Digit (Enable)**

**Do Not Transmit I 2 of 5 Check Digit (Disable)**

# Convert I 2 of 5 to EAN-13

This parameter 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 must be set to 14, and the code must have a leading zero and a valid EAN-13 check digit.

**Convert I 2 of 5 to EAN-13 (Enable)**

**Do Not Convert I 2 of 5 to EAN-13 (Disable)**

# Enable/Disable Discrete 2 of 5

To enable or disable Discrete 2 of 5, scan the appropriate bar code below.

**Enable Discrete 2 of 5**

**Disable Discrete 2 of 5**

# Set Lengths for Discrete 2 of 5

Lengths for D 2 of 5 may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters) the code contains, and includes check digits.

**One Discrete Length** - This option allows you to decode only those codes containing a selected length. For example, if you select **D 2 of 5 One Discrete Length**, then scan **1**, **4**, the only D 2 of 5 symbols decoded are those containing 14 characters. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**D 2 of 5 - One Discrete Length**

**Two Discrete Lengths** - This option allows you to decode only those codes containing two selected lengths. For example, if you select **D 2 of 5 Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, the only D 2 of 5 symbols decoded are those containing 2 or 14 characters. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**D 2 of 5 - Two Discrete Lengths**

**Length Within Range** - This option allows you to decode a code type within a specified range. For example, to decode D 2 of 5 symbols containing between 4 and 12 characters, first scan **D 2 of 5 Length Within Range**. Then scan **0**, **4**, **1,** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**D 2 of 5 - Length within Range**

**Any Length** - Scanning this option allows you to decode D 2 of 5 symbols containing any number of characters.

---

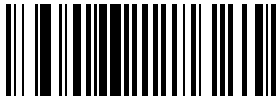
**Note:** *Selecting this option may lead to misdecodes for D 2 of 5 codes.*

---

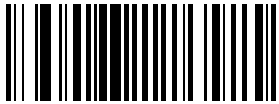
**D 2 of 5 - Any Length**

# Enable/Disable Codabar

To enable or disable Codabar, scan the appropriate bar code below.



**Enable Codabar**



**Disable Codabar**

# Set Lengths for Codabar

Lengths for Codabar may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters) the code contains. It also includes any start or stop characters.

**One Discrete Length** - This option allows you to decode only those codes containing a selected length. For example, if you select **Codabar One Discrete Length**, then scan **1**, **4**, the only Codabar symbols decoded are those containing 14 characters. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**Codabar - One Discrete Length**

**Two Discrete Lengths** - This option allows you to decode only those codes containing two selected lengths. For example, if you select **Codabar Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, the only Codabar symbols decoded are those containing 2 or 14 characters. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**Codabar - Two Discrete Lengths**

**Length Within Range** - This option allows you to decode a code type within a specified range. For example, to decode Codabar symbols containing between 4 and 12 characters, first scan **Codabar Length Within Range**. Then scan **0**, **4**, **1**, and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**Codabar - Length within Range**

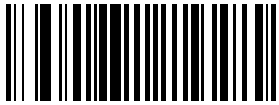
**Any Length** - Scanning this option allows you to decode Codabar symbols containing any number of characters.

**Codabar - Any Length**

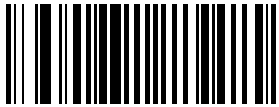
# CLSI Editing

When enabled, this parameter strips the start and stop characters and inserts a space after the first, fifth, and tenth characters of a 14-character Codabar symbol.

**Note:** *Symbol length does not include start and stop characters.*



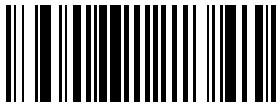
**Enable CLSI Editing**



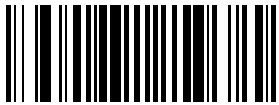
**Disable CLSI Editing**

# NOTIS Editing

When enabled, this parameter strips the start and stop characters from decoded Codabar symbol.



**Enable NOTIS Editing**



**Disable NOTIS Editing**

# Enable/Disable MSI Plessey

To enable or disable MSI Plessey, scan the appropriate bar code below.

**Enable MSI Plessey**

**Disable MSI Plessey**

# Set Lengths for MSI Plessey

Lengths for MSI Plessey may be set for any length, one or two discrete lengths, or lengths within a specific range. The length of a code refers to the number of characters (i.e., human readable characters) the code contains, and includes check digits.

**One Discrete Length** - This option allows you to decode only those codes containing a selected length. For example, if you select **MSI Plessey One Discrete Length**, then scan **1**, **4**, the only MSI Plessey symbols decoded are those containing 14 characters. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**MSI Plessey - One Discrete Length**

**Two Discrete Lengths** - This option allows you to decode only those codes containing two selected lengths. For example, if you select **MSI Plessey Two Discrete Lengths**, then scan **0**, **2**, **1**, **4**, the only MSI Plessey symbols decoded are those containing 2 or 14 characters. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**MSI Plessey - Two Discrete Lengths**

**Length Within Range** - This option allows you to decode a code type within a specified range. For example, to decode MSI Plessey symbols containing between 4 and 12 characters, first scan **MSI Plessey Length Within Range**. Then scan **0**, **4**, **1,** and **2** (single digit numbers must always be preceded by a leading zero). Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**MSI Plessey - Length WIthin Range**

**Any Length** - Scanning this option allows you to decode MSI Plessey symbols containing any number of characters.

---

**Note:** *Selecting this option may lead to misdecodes for MSI Plessey codes.*

---

**MSI Plessey - Any Length**

# 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

Scan a symbol below to transmit the data with or without the check digit.

**Transmit MSI Plessey Check Digit (Enable)**

Scan this symbol if you want to transmit the data without the check digit.

**Do Not Transmit MSI Plessey Check Digit (Disable)**

# MSI Plessey Check Digit Algorithm

When 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 11/Mod 10**

**Mod 10/Mod 10**

# Enable/Disable PDF417

Scan a bar code below to enable or disable PDF417 scanning.

**Note:** *This parameter is available only on the P 300PRO.*

**Enable PDF417**

**Disable PDF417**

# Enable/Disable MicroPDF

Scan a bar code below to enable or disable MicroPDF417 scanning.

**Note:** *This parameter is available only on the P 300PRO.*

**Enable MICROPDF417**

**Disable MICROPDF417**

# Code 128 Emulation

When this parameter is enabled, the scanner transmits data from certain MicroPDF417 symbols as if it was encoded in Code 128 symbols. Transmit AIM Symbology Identifiers must be enabled for this parameter to work.

If Code 128 Emulation is enabled, these MicroPDF417 symbols are transmitted with the one of the following prefixes:

**]C1** if the first codeword is 903-907, 912, 914, 915

**]C2** if the first codeword is 908 or 909

**]C0** if the first codeword is 910 or 911

If disabled, they are transmitted with one of the following prefixes:

**]L3** if the first codeword is 903-907, 912, 914, 915

**]L4** if the first codeword is 908 or 909

**]L5** if the first codeword is 910 or 911

Scan a bar code below to enable or disable Code 128 Emulation.

**Enable Code 128 Emulation**

**Disable Code 128 Emulation**

# UCC/EAN-128 Emulation

Certain MicroPDF417 symbols can be "linked" with a linear symbol during transmission as if they were one symbol. The MicroPDF417 symbol provides supplemental data to the linear symbol. Three scanning options are offered for these symbols:

- If Decode Linked Symbol is selected, Code 128, ITF-14 and UPC/EAN symbols are not decoded unless a MicroPDF417 symbol beginning with codeword 906, 907, 912, 914, or 915 is present.
- If Ignore Linked Symbol is selected, MicroPDF417 symbols beginning with codeword 906, 907, 912, 914, or 915 are ignored.
- If Autodiscriminate Linked Symbol is selected, the scanner looks for a MicroPDF417 symbol when scanning a 1-D symbol. If a MicroPDF417 symbol is not detected within the timeout period, the 1-D symbol data is transmitted.

The Timeout Between Decodes, Different Symbols parameter must be set to 0 before Ignore Linked Symbol or Autodiscriminate Linked Symbol can be selected.

Select one option for UCC/EAN 128 Emulation by scanning the appropriate bar code.

**Decode Linked Symbol**

**Ignore Linked Symbol**

**Autodiscriminate Linked Symbol**

# Scanning Mode

This parameter allows you to select one of the following scanning mode options (see *P 300PRO Scanning Mode Options* on page 1-8 for descriptions):

- Smart Raster
- Slab Only Raster
- Always Raster
- Programmable Raster

Select a scanning mode.

**Note:** *This parameter is available only on the P 300PRO.*

**Smart Raster**

**Slab Only Raster**

**Always Raster**

**Programmable Raster**

## Programmable Raster Height And Raster Expansion Speed

**Note:** *This parameter is available only on the P 300PRO.*

This parameter allows you to select the laser pattern's height and rate of expansion, and is only used when Programmable Raster or Always Raster is enabled. This parameter is intended for very specific applications, and is usually not necessary.

Select the laser pattern's height and/or rate of expansion.

1. Scan the bar code for either **RASTER HEIGHT** or **RASTER EXPANSION SPEED** below.
2. To represent a two-digit value, scan two bar codes from the next page. Valid values are between 01 and 15.
3. If you make an error, or wish to change your selection, scan **CANCEL**.

**Raster Height (Default 15)**

**Raster Expansion Speed (Default 11)**

## *Programmable Raster Height And Raster Expansion Speed (Continued)*

**0**

**1**

**2**

**3**

**4**

**5**

**6**

**7**

**8**

**9**

**Cancel**

## Aiming Mode

**Note:** *This parameter is available only on the P 300PRO.*

This parameter allows you to select either an aiming dot or slab raster for aiming. See *Aiming Modes* on page 1-10 for descriptions.

Select the aiming mode.

**Note:** *Aiming modes can not be used with the Always Raster scanning option.*

**Slab Raster**

**Aiming Dot**
**(Normal Timeout)**

**Aiming Dot**
**(Extended Timeout)**

# 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 prefix already selected, the code ID character is inserted between the prefix and the decoded symbol.

The user may select no code ID character, a Symbol Code ID character, or an AIM Code ID character. The Symbol Code ID characters are listed below; see AIM Code Identifiers in Appendix A, *Programming Reference*.

A = UPC-A, UPC-E, EAN-8, EAN-13

B = Code 39

C = Codabar

D = Code 128

E = Code 93

F = Interleaved 2 of 5

G = Discrete 2 of 5, or Discrete 2 of 5 IATA

J = MSI Plessey

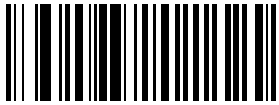
K = UCC/EAN-128

L = Bookland EAN

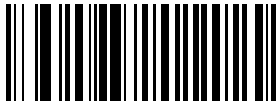
M = Trioptic Code 39

X = PDF 417

# Transmit Code ID Character



**Symbol Code ID Character**



**AIM Code ID Character**

**None**

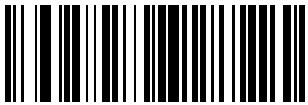
# Pause Duration

This parameter inserts a pause at any point in the data transmission. Pauses are set by scanning a two-digit number (i.e. two bar codes), and are measured in 0.1 second intervals. For example, scanning bar codes “0” and “1” inserts a 0.1 second pause; “0” and “5” gives you a 0.5 second delay. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **DATA FORMAT CANCEL** on page 2-96.

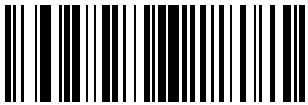
**Pause Duration**

# Prefix/Suffix Values

A prefix/suffix may be appended to scan data for use in data editing. These values are set by scanning a four-digit number (i.e., four bar codes) that corresponds to key codes for various terminals. See Table A-2., *AIM Code Identifiers* in Appendix A, *Programming Reference* for conversion information. Numeric bar codes begin on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.



**Scan Prefix**

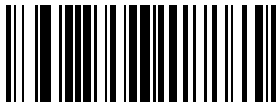


**Scan Suffix**

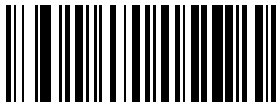
**Data Format Cancel**

# Scan Data Transmission Format

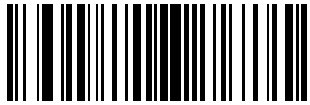
To change the Scan Data Transmission Format, scan the **SCAN OPTIONS** bar code below. Then select one of four options. When you have made your selection, scan the **ENTER** bar code on the next page. If you make a mistake, scan the **DATA FORMAT CANCEL** bar code on the next page.



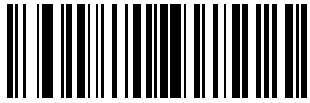
**Scan Options**



**Data As Is**



**<Data> <Suffix>**



**<Prefix> <Data>**

**<Prefix> <Data> <Suffix>**

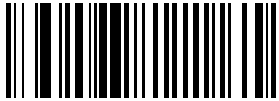
**Enter**

**Data Format Cancel**

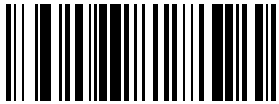
# RS-232C Parameters

## *Baud Rate*

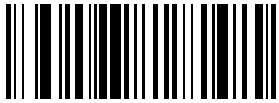
Baud rate is the number of bits of data transmitted per second. The scanner's baud rate setting should match the data rate setting of the host device. If not, data may not reach the host device or may reach it in distorted form.



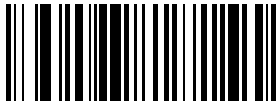
**Baud Rate 600**



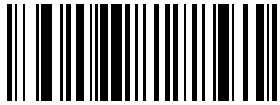
**Baud Rate 1200**



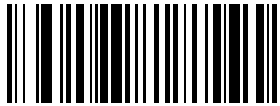
**Baud Rate 2400**



**Baud Rate 4800**



**Baud Rate 9600**



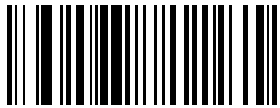
**Baud Rate 19,200**

**Baud Rate 38,400**

## *Parity*

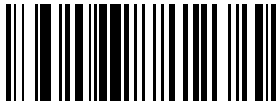
A parity check bit is the most significant bit of each ASCII coded character. Select the parity type according to host device requirements.

- If you select **ODD** parity, the parity bit has a value 0 or 1, based on data, to ensure than an odd number of 1 bits are contained in the coded character.



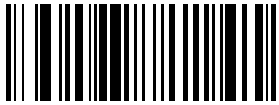
**Odd**

- If you select **EVEN** parity, the parity bit has a value 0 or 1, based on data, to ensure than an even number of 1 bits are contained in the coded character.



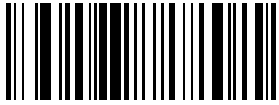
**Even**

- Select **MARK** parity and the parity bit is always 1.



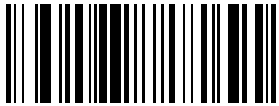
**Mark**

- Select **SPACE** parity and the parity bit is always 0.



**Space**

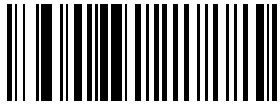
- If no parity is required, select **NONE**.



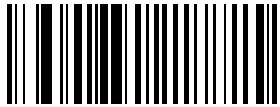
**None**

## *Check Parity*

Select whether or not the parity, framing, and overrun of received characters are checked. The type of parity used is selectable through the **PARITY** parameter.



**Check for Received Errors**



**Do Not Check for Received Errors**

## *Hardware Handshaking*

The data interface consists of an RS-232C port, designed to operate either with or without the hardware handshaking lines, *Request to Send (*RTS*)*, and *Clear to Send (*CTS*)*.

If Standard RTS/CTS handshaking is selected, scan data is transmitted according to the following sequence:

- The controller reads the CTS line for activity. If CTS is asserted, the controller waits up to 2 seconds for the host to negate the CTS line. If, after 2 seconds (default), the CTS line is still asserted, the scanner sounds a transmit error and any scanned data is lost.
- When the CTS line is negated, the controller asserts the RTS line and waits up to 2 seconds for the host to assert CTS. When the host asserts CTS, data is transmitted. If, after 2 seconds (default), the CTS line is not asserted, the scanner sounds a transmit error and discards the data.
- When data transmission is complete, the controller negates RTS 10 msec after sending the last character.
- The host responds by negating CTS. The controller checks for a negated CTS upon the next transmission of data.

During the transmission of data, the CTS line should be asserted. If CTS is deasserted for more than 50 ms between characters, the transmission is aborted, the scanner sounds a transmission error, and the data is discarded.

If the above communications sequence fails, the scanner issues an error indication. In this case, the data is lost and must be rescanned.

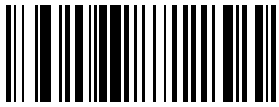
If Hardware Handshaking and Software Handshaking are both enabled, Hardware Handshaking takes precedence.

---

**Note:** *The DTR signal is jumpered active.*

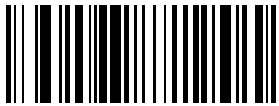
---

Scan the bar code below if no Hardware Handshaking is desired.



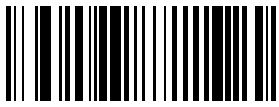
**None**

Scan the bar code below to select Standard RTS/CTS Hardware Handshaking.



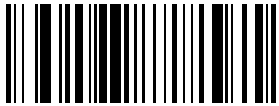
**Standard RTS/CTS**

When RTS/CTS Option 1 is selected, the scanner asserts RTS before transmitting and ignores the state of CTS. The scanner deasserts RTS when the transmission is complete.



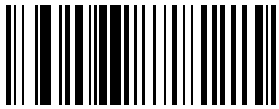
**RTS/CTS Option 1**

When Option 2 is selected, RTS is always high or low (user-programmed logic level). However, the scanner waits for CTS to be asserted before transmitting data. If CTS is not asserted within 2 seconds (default), the scanner issues an error beep and discards the data.



**RTS/CTS Option 2**

When Option 3 is selected, the scanner asserts RTS prior to any data transmission, regardless of the state of CTS. The scanner waits up to 2 seconds (default) for CTS to be asserted. If CTS is not asserted during this time, the scanner issues an error beep and discards the data. The scanner deasserts RTS when transmission is complete.



**RTS/CTS Option 3**

## *Software Handshaking*

This parameter offers control of the data transmission process in addition to, or instead of, that offered by hardware handshaking. There are five options.

If Software Handshaking and Hardware Handshaking are both enabled, Hardware Handshaking takes precedence.

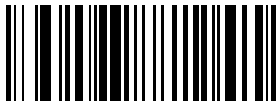
- None
  When this option is selected, data is transmitted immediately.

**None**

- ACK/NAK
  When this option is selected, after transmitting data, the scanner expects either an ACK or NAK response from the host. Whenever a NAK is received, the scanner

transmits the same data again and waits for either an ACK or NAK. After three unsuccessful attempts to send data when NAKs are received, the scanner issues an error beep and discards the data.

The scanner waits up to the programmable Host Serial Response Time-out to receive an ACK or NAK. If the scanner does not get a response in this time, it issues an error beep and discards the data. There are no retries when a time-out occurs.



**ACK/NAK**

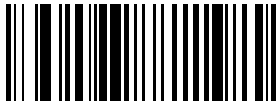
- ENQ

  When this option is selected, the scanner waits for an ENQ character from the host before transmitting data. If an ENQ is not received within 2 seconds, the scanner issues an error indication and discards the data. The host must transmit an ENQ character at least every 2 seconds to prevent transmission errors.

**ENQ**

- ACK/NAK with ENQ

  This combines the two previous options.

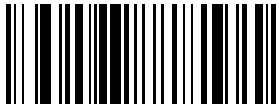


**ACK/NAK with ENQ**

- XON/XOFF

  An XOFF character turns the scanner transmission off until the scanner receives an XON character. There are two situations for XON/XOFF:

- XOFF is received before the scanner has data to send. When the scanner has data to send, it then waits for an XON character before transmission. The scanner waits up to 2 seconds to receive the XON. If the XON is not received within this time, the scanner issues an error beep and discards the data.
- XOFF is received during a transmission. Data transmission then stops after sending the current byte. When the scanner receives an XON character, it sends the rest of the data message. The scanner waits indefinitely for the XON.

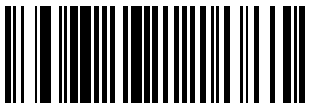


**XON/XOFF**

## Host Serial Response Time-out

This parameter specifies how long the scanner waits for an ACK, NAK, or CTS before determining that a transmission error has occurred. This only applies when in one of the ACK/NAK Software Handshaking modes, or RTS/CTS Hardware Handshaking option.

The delay period can range from 0.0 to 9.9 seconds in .1-second increments. After scanning the bar code below, scan two numeric bar codes beginning on page 2-120. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

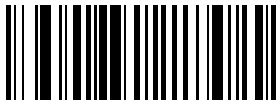


**Host Serial Response Time-out**

## RTS Line State

This parameter sets the idle state of the Serial Host RTS line. Select **Low or High RTS** line state.

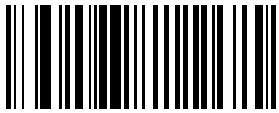
**Host: Low RTS**



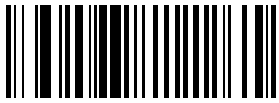
**Host: High RTS**

## *Stop Bit Select*

The stop bit(s) at the end of each transmitted character marks the end of transmission of one character and prepares the receiving device for the next character in the serial data stream. The number of stop bits selected (one or two) depends on the number the receiving terminal is programmed to accommodate. Set the number of stop bits to match host device requirements.



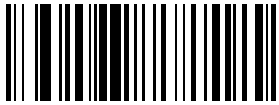
**1 Stop Bit**



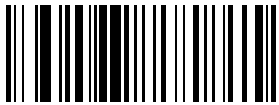
**2 Stop Bits**

## ASCII Format

This parameter allows the scanner to interface with devices requiring a 7-bit or 8-bit ASCII protocol.



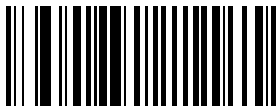
**7-Bit**



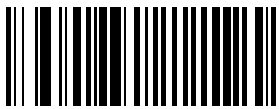
**8-Bit**

## Beep on <BEL>

When this parameter is enabled, the scanner issues a beep when a <BEL> character is detected on the RS-232C serial line. <BEL> alerts the user that an illegal entry or other important event has occurred.



**Beep On <BEL> Character (Enable)**



**Do Not Beep on <BEL> Character (Disable)**

## *Intercharacter Delay*

Select the intercharacter delay option matching host requirements. The intercharacter delay gives the host system time to service its receiver and perform other tasks between characters. The delay period can range from no delay to 99 msec in 1-msec increments. After scanning the bar code below, scan two bar codes beginning on page 2-120 to set the desired time-out. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**Intercharacter Delay**

# Wand Parameters

## *Wand Host Interface*

**Note:** *This parameter is available only on the P 300FZY.*

Select the appropriate host by scanning one of the bar codes below.

**Symbollink Controller**

**Symbol Portable Terminal**

**Norand Terminal**

## Wand Emulator Bar Output

**Note:** *This parameter is available only on the P 300FZY.*

Select the option that matches your host system.

**Bar High**

**Bar Low**

## *Variable Leading Margin*

**Note:** *This parameter is available only on the P 300FZY.*

Select a variable leading margin.

**80 msec**

**110 msec**

**90 msec**

**120 msec**

**100 msec**

**130 msec**

## *Variable Leading Margin (cont'd)*

**140 msec**

**170 msec**

**150 msec**

**180 msec**

**160 msec**

**190 msec**

**200 msec**

## Convert All to Code 39

**Note:** *This parameter is available only on the P 300FZY.*

Select whether or not to convert the decoded output to Code 39.

**Convert All to Code 39**

**Do Not Convert All to Code 39**

# Keyboard Wedge Parameters

## *Host Interfaces*

**Note:** *This parameter is available only on the P 300FZY.*

Use these bar codes to select your host interface.

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

**IBM PS/2-30**

**IBM PC/XT**

**NCR 7052**

## National Keyboard Types

**Note:** *This parameter is available only on the P 300FZY.*

Use these bar codes to select the appropriate national keyboard type.

**North American**

**French**

**German**

**French International**

**Spanish**

**Italian**

**Swedish**

**British**

## *Fast Transmit*

**Note:** *This parameter is available only on the P 300FZY.*

Older systems may require a slower transmission method. If your system still needs additional time to process keyboard data after setting an Intercharacter Delay, scan the DISABLE FAST TRANSMIT bar code.

**Enable Fast Transmit**

**Disable Fast Transmit**

## Intercharacter Delay

**Note:** *This parameter is available only on the P 300FZY.*

Select the intercharacter delay option matching host requirements. The intercharacter delay gives the host system time to service its receiver and perform other tasks between characters. The delay period can range from no delay to 99 msec in 1-msec increments. After scanning the bar code below, scan two bar codes beginning on page 2-120 to set the desired time-out. If you make an error or wish to change your selection, scan **CANCEL** on page 2-122.

**Intercharacter Delay**

## Convert Control Characters

When enabled, this parameter converts special control character sequences to their corresponding keycodes. It converts the <CTRL> M, <CTRL> I, and <CTRL> [ sequences to <Enter>, <Tab>, <Backspace>, and <Esc> respectively.

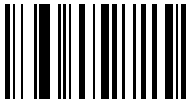
**Note:** *This parameter is available on the P 300FZY only.*

**Disable Convert Control Character**

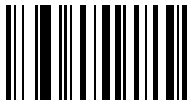
**Enable Convert Control Character**

# Numeric Bar Codes

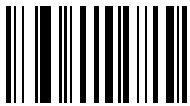
For parameters requiring specific numeric values, scan the appropriately numbered bar code(s).



**0**

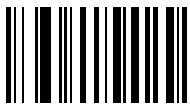


**1**



**2**

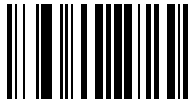
**3**



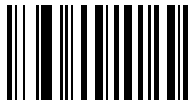
**4**

**5**

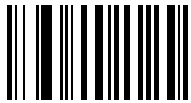
**6**



**7**



**8**



**9**

## Cancel

If you make an error or wish to change your selection, scan the bar code below.

**Cancel**

# Macro PDF Features

This section discusses programmable Macro PDF features fully supported by the P 300PRO scanner. Macro PDF is a special feature for concatenating multiple PDF symbols into one file. The P 300PRO can decode symbols that are encoded with this feature.

### *Caution*

When printing, keep each Macro PDF sequence separate, for each sequence has unique identifiers. Do not mix bar codes from several Macro PDF sequences, even if they encode the same data. When scanning Macro PDF sequences, scan the entire Macro PDF sequence without interruption. If you scan a mixed sequence, you get two long low beeps (Lo Lo) for inconsistent file ID or inconsistent symbology error.

Before programming these special features, follow the physical setup instructions in *Chapter 1, Getting Started*. Then program the required generic decode and data transmission parameters using the bar codes on the following pages. Use the same programming method for setting Macro PDF features as used for standard features.

Note that all parameter settings are stored in non-volatile memory and so are retained after powerdown.

## Macro PDF Transmit / Decode Mode Symbols

Select only one of the four options below for handling the decoding of Macro PDF.

- **Buffer All Symbols / Transmit Macro PDF When Complete:** This activates transmission of all decode data from an entire Macro PDF sequence. Transmission does not occur until the entire Macro PDF sequence is scanned and decoded. This is the default option.

  If the decode data exceeds the limit of the space available in RAM, there is no transmission because the entire sequence has not been scanned, and an error occurs. Use the parameter Flush Macro PDF Buffer to purge the buffer.
- **Transmit Any Symbol in Set / No Particular Order**: This causes transmission of data from each Macro PDF417 symbol as decoded, whether it is in sequential order or not. Up to 1024 Macro PDF bar codes may be transmitted.
- **Scan in Sequence Only / Transmit in Sequence Without Buffering**: This causes transmission of data from each symbol within the Macro PDF sequence as decoded, provided the Macro PDF symbols are scanned in order. If you do not scan the symbols in order, an error occurs. Up to 1024 Macro PDF bar codes may be transmitted.
- **Buffer Scans Out of Order / Transmit Scans in Order**: When enabled, decode data from each symbol within the Macro PDF sequence is transmitted when decoded, provided that the Macro PDF symbols are scanned in order. Decode data from symbols out of order in the Macro PDF sequence is buffered. If the decode data exceeds the limit of the space available in RAM, there is no transmission because the entire sequence has not been scanned, and an error occurs. Use the parameter Flush Macro PDF Buffer to purge the buffer.

## *Macro PDF Transmit / Decode Mode Symbols (Continued)*

**Buffer All Symbols /**
**Transmit When Complete - Default**

**Transmit Any Symbol In Set /**
**No Particular Order**

**Scan In Sequence Only /**
**Transmit In Sequence Without Buffering**

**Buffer Scans Out Of Order/**
**Transmit Scans In Order**

## Transmit Symbols in Codeword Format

Enabling this activates transmission of each PDF symbol as directly decoded data codewords, whether that symbol is part of a macro PDF sequence or not. Note that data is output as *codeword values — not as interpreted data*.

"Codeword values" is an ASCII representation of a number from 000 to 928 for each codeword, preceded by an escape character. This escape character is a backslash by default, but the user may change this value. For example, the codeword value 005 is sent to the host in the form of **\005** for GLIs, and **\C005C** for ECIs. This output format is based on the *AIM USA Uniform Symbology Specification* for PDF417 (1994).

All output codewords take up exactly 4 characters for GLIs and 6 characters for ECIs. However, there may be non-decodable characters in the PDF symbol, such as a GLI sequence. This special codeword sequence activates a certain kind of interpretation to the encoded data. Non-decodable codewords like GLIs are embedded in the output stream just like any other codeword, e.g., \927\001.

Because GLIs are indistinguishable from other codewords in the output data stream, the host must intelligently recognize them as GLIs and process their interpretations.

Note that when a macro PDF sequence is transmitted, the last character in the last block of data transmitted is always**\922** (if selected). This indicates the end of that macro PDF transmission.

## *Transmit Symbols in Codeword Format (Continued)*

Enable or disable by scanning the appropriate bar code.

**Enable Transmit In Codeword Format**

**Disable Transmit In Codeword Format**

## *Escape Characters*

This enables the backslash (\) character as an Escape character for systems that can process transmissions containing special data sequences. Scan a bar code below to either format special data (e.g., GLI escapes, MacroPDF417 Control Block optional fields) according to the GLI (Global Label Identifier) protocol or the ECI (Extended Channel Interpretation) protocol, or to disable this parameter.

**ECI Protocol**

**GLI Protocol**

**None**

## *Delete Character Set ECIs*

This parameter enables the scanner to delete any escape sequences representing Character Set ECIs (also known as GLIs) from its buffer before transmission. In many receiving systems, Character Set ECIs can be removed without affecting the way data is displayed or processed.

When deletion is selected, the scanner transmits data from PDF417 and MicroPDF417 bar codes containing Character Set ECIs, even when the ECI Protocol is disabled.

Scan a bar code to delete or transmit character set ECIs.

**Delete Character Set ECIs**

**Transmit Character Set ECIs**

## ECI Decoder

This parameter enables the scanner to interpret any Extended Channel Interpretations (ECIs) that are supported by the scanner firmware. This parameter has no effect on symbols that were not encoded using ECIs. This version of the product supports ECIs 000900 through 000913, used for efficient encoding of Common Data Syntax Format 00-99. If this parameter is disabled, and a symbol is scanned that was encoded using an ECI escape, the scanner transmits the ECI escape followed by the uninterpreted data.

Scan a bar code to enable or disable this option.

**Enable ECI Decoder**

**Disable ECI Decoder**

## *Transmit Unknown Codewords*

This enables using the output codeword format for transmitting any non-GLI or non-macro PDF codeword. If this is *not* enabled and an unknown codeword is found, a decode error beep sounds.

Enable or disable by scanning the appropriate bar code.

**Transmit Unknown Codewords**

**Do Not Transmit Unknown Codewords**

## Transmit Macro PDF User-Selected Fields

When enabled, the following parameters cause transmission of the specified field in subsequently scanned Macro PDF417 symbols. Unless transmission of a specific field is enabled, it is not transmitted. The options cannot be changed in the middle of a Macro PDF set entry. All user-selected fields are prefixed by \923 for GLIs, and \C923C for ECIs. Tags and examples in the following parameters demonstrate GLI protocol, but the ECI tag (\C923C) can be used instead if ECI protocol is enabled.

- **Transmit File Name**: Activates transmission of the file name field. The field character tag is \923\000. For example, the filename MANHOURS.WK1 is sent as: \923\000MANHOURS.WK1.
- **Transmit Block Count**: This activates transmission of the block count field. The field character tag is \923\001. For example, the field may be: \923\0011856.
- **Transmit Time Stamp**: This activates transmission of the time stamp field. The field character tag is \923\002. For example, the field may be: \923\0022123443243234.
- **Transmit Sender**: Activates transmission of the sender field. The field character tag is \923\003. For example, the field may be: \923\003Symbol TechnologiesHoltsville, NY.
- **Transmit Addressee**: Activates transmission of the addressee field. The field character tag is \923\004. For example, the field may be: \923\004AIM USA.
- **Transmit File Size**: Activates transmission of the file size field. The field character tag is \923\005. For example, the field may be: \923\005179234.
- **Transmit Checksum**: Activates transmission of the checksum field. The field character tag is \923\006. For example, the field may be: \923\00663823.
- **Transmit Macro PDF Control Header**: Activates transmission of the control header, which contains the segment index and the file ID. For example, the field may be: \92800000\725\120\343. The five digits after the \928 are the segment index (or block index), and \725\120\343 is the file ID.
- **Enable / Disable Last Block Marker**: This enables marking the last block in the set by the codeword \922.

## *Transmit Macro PDF User-Selected Fields (Continued)*

Enable or disable by scanning the appropriate bar code.

**Enable File Name Transmit**

**Disable File Name Transmit**

**Enable Time Stamp Transmit**

**Disable Time Stamp Transmit**

**Enable Block Count Transmit**

**Disable Block Count Transmit**

**Enable Sender Transmit**

**Disable Sender Transmit**

## *Transmit Macro PDF User-Selected Fields (Continued)*

**Enable Addressee Transmit**

**Disable Addressee Transmit**

**Enable Checksum Transmit**

**Disable Checksum Transmit**

**Enable File Size Transmit**

**Disable File Size Transmit**

**Enable Macro PDF Control Header Transmit**

**Disable Macro PDF Control Header Transmit**

**Enable Last Block Marker**

**Disable Last Block Marker**

## Flush Macro Buffer

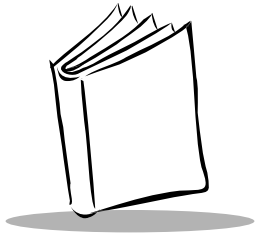
This flushes the buffer of all decoded Macro PDF data stored to that point, transmits it to the host device, and aborts from Macro PDF mode.

**Flush Macro PDF Buffer**

## Abort Macro PDF Entry

This clears all currently-stored Macro PDF data in the buffer without transmission and aborts from Macro PDF mode.

**Abort Macro PDF Entry**



# *Chapter 3*
# *Advanced Data Formatting (ADF)*

## Introduction

Advanced Data Formatting (ADF) is a means of customizing, or editing, the data scanned by the scanner before transmitting the data to your host device. Scanned data can be edited to suit your particular requirements.

ADF is implemented by scanning a related series of bar codes to create rules to apply to the scanned data. These bar codes appear later in this chapter.

## Rules: Criteria Linked to Actions

In ADF, data is customized through **rules**. These rules perform specific actions when the data meets certain criteria. One rule may consist of single or multiple actions applied to single or multiple criteria.

For instance, a data formatting rule could be the following:

**Criteria:** *When scan data is Code 39, length 12,*
*and data at the start position is the string "129",*

**Actions:** *pad all sends with zeros to length 8,*
*send all data up to X,*
*send a space.*

In this example, if a Code 39 bar code of 1299X1559828 is scanned, the following is transmitted: 00001299<space>. If a Code 39 bar code of 1299X15598 is scanned, this rule is ignored because the length (10 characters) does not pass the criteria.

The rule specifies the editing conditions and requirements before data transmission occurs.

# Using ADF Bar Codes

When you program a rule, make sure the rule is logically correct. Plan ahead before you start scanning.

To program each data formatting rule:

1. **Start the Rule**. Scan the **Begin New Rule** bar code on page 3-11.
2. **Criteria**. Scan the bar codes for all pertinent criteria. Criteria can include code type (e.g., Code 128), code length, or data that contains a specific character string (e.g., the digits "129"). These options are described in *Criteria* on page 3-14.
3. **Actions**. Scan all actions related to, or affecting, these criteria. The actions of a rule specify how to format the data for transmission. These options are described in *Actions* on page 3-25.
4. **Save the Rule**. Scan the **Save Rule** bar code on page 3-11. This places the rule in the "top" position in the rule buffer.

If you make errors during this process, some special-purpose bar codes may be useful: **Erase Criteria and Start Again**, **Erase Actions and Start Again**, **Erase Previously Saved Rule**, and **Erase All Rules**. See *Erase* on page 3-12.

*Beeper Definitions for ADF* on page 3-8 help guide you through the programming steps.

# ADF Bar Code Menu Example

This section provides an example of how to enter an ADF rule to apply to scanned data.

An auto parts distribution center wants to encode manufacturer ID, part number, and destination code into their own Code 128 bar codes. The distribution center also has products that carry UPC bar codes, placed there by the manufacturer. The Code 128 bar codes have the following format:

**MMMMMPPPPPDD**

Where: M = Manufacturer ID

P = Part Number

D = Destination Code

The distribution center uses a PC with dedicated control characters for manufacturer ID <CTRL M>, part number <CTRL P>, and destination code <CTRL D>. At this center the UPC data is treated as manufacturer ID code.

The following rules need to be entered:

When scanning data of code type Code 128, send the next 5 characters, send the manufacturer ID key <CTRL M>, send the next 5 characters, send the part number key <CTRL P>, send the next 2 characters, send the destination code key <CTRL D>.

When scanning data of code type UPC/EAN, send all data, send the manufacturer ID key <CTRL M>.

To enter these rules, follow these steps:

## Rule 1: The Code 128 Scanning Rule

**Table 3-1. Code 128 Scanning Rule**

| Step | Bar Code | On Page | Beep Indication |
|---|---|---|---|
| 1 | Begin New Rule | 3-11 | High High |
| 2 | Code 128 | 3-14 | High High |
| 3 | Send next 5 characters | 3-26 | High High |
| 4 | Send <CTRL M> | 3-51 | High High |
| 5 | Send next 5 characters | 3-26 | High High |
| 6 | Send <CTRL P> | 3-51 | High High |
| 7 | Send next 2 characters | 3-25 | High High |
| 8 | Send <CTRL D> | 3-49 | High High |
| 9 | Save Rule | 3-11 | High Low High Low |

## Rule 2: The UPC Scanning Rule

**Table 3-2. UPC Scanning Rule**

| Step | Bar Code | On Page | Beep Indication |
|---|---|---|---|
| 1 | Begin New Rule | 3-11 | High High |
| 2 | UPC/EAN | 3-15 | High High |
| 3 | Send all remaining data | 3-25 | High High |
| 4 | Send <CTRL M> | 3-51 | High High |
| 5 | Save Rule | 3-11 | High Low High Low |

If you made any mistakes while entering this rule, scan the **Quit Entering Rules** bar code on page 3-12. If you already saved the rule, scan the **Erase Previously Saved Rule** bar code on page 3-12.

## Alternate Rule Sets

ADF rules may be grouped into one of five alternate sets that can be turned on and off when needed. This is useful when you want to format the same message in different ways. For example, a Code 128 bar code contains the following information:

**Class (2 digits), Stock Number (8) digits, Price (5 digits)**

This bar code might look like this:

**245671243701500**

where:

**Class = 24**

**Stock Number = 56712437**

**Price = 01500**

Ordinarily you would send this data as follows:

**24 (class key)**

**56712437 (stock key)**

**01500 (enter key)**

But, when there is a sale, you may want to send only the following:

**24 (class key)**

**56712437 (stock key)**

and the cashier keys the price manually.

To implement this, first enter an ADF rule that applies in the normal situation. This rule may look like this:

**When scanning a bar code of length 15, send the next 2 characters, send the class key, send the next 8 characters, send the stock key, send the data that remains, send the Enter key.**

The "sale" rule may look like this:

**When scanning a bar code of length 15, send the next 2 characters, send the class key, send the next 8 characters, send the stock key.**

To switch between the two sets of rules, a "switching rule" must be programmed. This rule specifies what type of bar code must be scanned to switch between the rule sets. For example,

in the case of the "sale" rule above, the rule programmer wants the cashier to scan the bar code "M" before a sale. To do this, a rule can be entered as follows:

**When scanning a bar code of length 1 that begins with "M", select rule set number 1.**

Another rule could be programmed to switch back.

**When scanning a bar code of length 1 that begins with "N", turn off rule set number 1.**

The switching back to normal rules can also be done in the "sale" rule. For example, the rule may look like this:

**When scanning a bar code of length 15, send the next 2 characters, send the class key, send the next 8 characters, send the stock key, turn off rule set 1.**

It is recommended that you scan the **Disable All Rule Sets** bar code after programming a rule belonging to an alternate rule set.

In addition to enabling and disabling rule sets within the rules, you can disable them by scanning the appropriate bar codes in *Disable Rule Set* on page 3-13.

## Rules Hierarchy (in Bar Codes)

The order of programming individual rules is important. The most general rule should be programmed first.

All programmed rules are stored in a buffer. As they are programmed, they are stored at the "top" of a rules list. If three rules have been created, the list would be configured as follows:

Third Rule

Second Rule

First Rule

When data is scanned, the rules list is checked from top to bottom to determine if the criteria matches (and therefore, if the actions should occur). Input is modified into the data format specified by the first matching set of criteria it finds. Be sure that your most general rule is the first one programmed.

For example, if the THIRD rule states:

**When scanning a bar code of any length, send all data, then send the ENTER key.**

And the SECOND rule states:

**When scanning a Code 128 bar code of length 12, send the first four characters, then send the ENTER key, then send all remaining data.**

If a Code 128 bar code of length 12 were scanned, the THIRD rule would be in effect. The SECOND rule would appear to not function.

Note also that ADF rules are actually created when you use the standard data editing functions. Scan options are entered as ADF rules, and the hierarchy mentioned above also applies to them. For the P 300, this applies to prefix/suffix programming in the parameter *Scan Data Transmission Format*.

These rules reside in the same "rule list" as ADF Rules, so the order of their creation is also important.

## Default Rules

Every unit has a default rule to send all scan data. Units with custom software may have one or more default rules burned in. The rules hierarchy checks user programmable rules first, then the default rules. Default rules can be disabled by entering the following general rule in the user programmable buffer:

**When receiving scan data, send all data.**

Since this rule always applies, ADF will never go into the default rules.

# Beeper Definitions for ADF

The following table defines beep sequences that occur during rule entry.

**Table 3-3. Beeper Definitions**

| Beeper Sequence | Indication |
|---|---|
| **Normal Data Entry. Duration of tones are short.** | |
| High-Low | Entry of a number is expected. Enter another digit. Add leading zeros to the front if necessary. |
| Low-Low | Entry of an alphabetic character is expected. Enter another character or scan the End of Message bar code. |
| High-High | Entry of Criterion/Action is expected. Enter another criterion or action, or scan the Save Rule bar code. |
| High-Low-High-Low | Rule saved. Rule entry mode exited. |
| High-Low-Low | All criteria or actions were cleared for rule currently being entered; continue entry of rule. |
| Low | Last saved rule was successfully deleted. The rule presently being entered is left intact. |
| Low-High-High | All rules are now deleted. The rule presently being entered is left intact. (This beep sequence has a different meaning outside of ADF.) |
| **Error Indications. Duration of tones are very long.** | |
| Low-High-Low-High | Out of rule memory. Erase some existing rules, then try to save rule again. (The current rule need not be re-entered.) |
| Low-High-Low | Cancel rule entry. Rule entry mode exited because of an error or the user asked to exit rule entry. |
| Low-High | Entry error, wrong bar code scanned. Re-enter criterion or action. All previously entered criteria and actions are retained. Criteria or action list is too long for a rule. |

# ADF Bar Codes

The following table helps you locate the bar codes you need to create an ADF rule.

**Table 3-4. ADF Bar Codes**

| Bar Code | Description | Page |
|---|---|---|
| **Special Commands** | | |
| Begin New Rule | Starts data formatting rule. | 3-11 |
| Save Rule | Completes and saves rule. | 3-11 |
| Erase | Erases criteria, actions, or rules. | 3-12 |
| Quit Entering Rules | Quits entering rules. | 3-12 |
| Disable Rule Set | Disables rule sets. | 3-13 |
| **Criteria** | | |
| Code Types | Selects code types to be affected by rule. | 3-14 |
| Code Lengths | Defines the number of characters each code type must contain. | 3-17 |
| Message Containing A Specific Data String | Select whether formatting affects data that begins with or contains a specific character or data string. | 3-22 |
| Numeric Keypad | Used for specifying a data string. | 3-23 |
| Rule Belongs To Set | Selects which set a rule belongs to. | 3-24 |
| **Actions** | | |
| Send Data | Sends all data that remains, sends all data up to a specific character, or sends N characters. | 3-25 |
| Send Pause | Inserts a pause. | 3-29 |
| Setup Field(s) | Moves the cursor in relation to a specified character. | 3-29 |
| Send Preset Value | Sends prefix and suffix values. | 3-36 |

**Table 3-4. ADF Bar Codes**

| Bar Code | Description | Page |
|---|---|---|
| Modify Data | Modifies data as follows: | 3-36 |
| ♦ Remove All Spaces | ♦ Removes all spaces in the send commands. | 3-36 |
| ♦ Crunch All Spaces | ♦ Leaves one space between words. | 3-36 |
| ♦ Stop Space Removal | ♦ Stops space removal. | 3-37 |
| ♦ Remove Leading Zeros | ♦ Removes all leading zeros. | 3-37 |
| ♦ Stop Zero Removal | ♦ Stops removal of zeros. | 3-37 |
| ♦ Pad Data With Spaces | ♦ Pads data to the left with spaces. | 3-38 |
| ♦ Pad Data With Zeros | ♦ Pads data to the left with zeros. | 3-43 |
| Beeps | Selects beep sequence for each rule. | 3-48 |
| Send Keystroke | Specifies control and keyboard characters to send. | 3-49 |
| ♦ Control Characters | ♦ Sends control characters. | 3-49 |
| ♦ Keyboard Characters | ♦ Sends keyboard characters. | 3-54 |
| ♦ Send ALT Characters | ♦ Sends ALT characters. | 3-66 |
| ♦ Send Command Characters | ♦ Sends command characters. | 3-70 |
| ♦ Send Special Characters | ♦ Sends special characters. | 3-72 |
| ♦ Send Keypad Characters | ♦ Sends keypad characters. | 3-73 |
| ♦ Send Function Keys | ♦ Sends function keys. | 3-77 |
| Turn On/Off Rule Sets | Turns rule sets on and off. | 3-83 |
| Alphanumeric Keyboard | Used to specify characters and strings when creating a rule. | 3-84 |

# Special Commands

Bar codes and explanations of the following special commands are provided on the next few pages.

- Begin New Rule
- Save Rule
- Erase
- Quit Entering Rules
- Disable Rule Set

## *Begin New Rule*

Scan this bar code to start entering a new data formatting rule.

**<FN3>7B1211**

**Begin New Rule**

## *Save Rule*

Scan this bar code to complete and save the rule you entered.

**<FN3>4**

**Save Rule**

## Erase

Use these bar codes to erase criteria, actions, or rules.

**<FN3>6C-**

**Erase Criteria And Start Again**

**<FN3>6A-**

**Erase Actions And Start Again**

**<FN3>81**

**Erase Previously Saved Rule**

**<FN3>80**

**Erase All Rules**

## Quit Entering Rules

Scan this bar code to quit entering rules.

**<FN3>6Q**

**Quit Entering Rules**

## *Disable Rule Set*

Use these bar codes to disable rule sets.

**<FN3>01**

**Disable Rule Set 1**

**<FN3>02**

**Disable Rule Set 2**

**<FN3>03**

**Disable Rule Set 3**

**<FN3>04**

**Disable Rule Set 4**

**<FN3>00**

**Disable All Rule Sets**

# Criteria

## *Code Types*

Select any number of code types to be affected. All selected codes must be scanned in succession, prior to selecting other criteria. If you don't select a code type, all code types are affected.

**<FN3>6C13D01**

**Code 39**

**<FN3>6C13D02**

**Codabar**

**<FN3>6C13D03**

**Code 128**

**<FN3>6C13D07**

**Code 93**

**<FN3>6C13D06**

**I 2 Of 5**

**<FN3>6C13D04**

**D 2 Of 5**

## *Code Types (continued)*

**<FN3>6C13D08**

**UPC-A**

**<FN3>6C13D09**

**UPC-E**

**<FN3>6C13D10**

**UPC-E1**

**<FN3>6C13D0A**

**EAN-8**

**<FN3>6C13D0B**

**EAN-13**

**<FN3>6C13D0F**

**EAN 128**

## *Code Types (continued)*

**<FN3>6C13D05**

**IATA 2 Of 5**

**<FN3>6C13D0E**

**MSI Plessey**

**<FN3>6C13D11**

**Bookland EAN**

**<FN3>6C13D12**

**Trioptic Code 39**

**<FN3>6C13D00**

**PDF417**

**<FN3>6C13D1A**

**ADF for Macro PDF417**
**(Applies rule to each block in MPDF set.)**

## *Code Lengths*

Define the number of characters the selected code type must contain. Select one length per rule only. If you don't select a code length, selected code types of any length are affected.

---

**Note:** *These codes are used to set the code length only; this is not a keypad.*

---

**<FN3>6C13701**

**1**

**<FN3>6C13702**

**2**

**<FN3>6C13703**

**3**

**<FN3>6C13704**

**4**

**<FN3>6C13705**

**5**

**<FN3>6C13706**

**6**

## *Code Lengths (continued)*

**<FN3>6C13707**

**7**

**<FN3>6C13708**

**8**

**<FN3>6C13709**

**9**

**<FN3>6C1370A**

**10**

**<FN3>6C1370B**

**11**

**<FN3>6C1370C**

**12**

## *Code Lengths (continued)*

**<FN3>6C1370D**

**13**

**<FN3>6C1370E**

**14**

**<FN3>6C1370F**

**15**

**<FN3>6C13710**

**16**

**<FN3>6C13711**

**17**

**<FN3>6C13712**

**18**

## *Code Lengths (continued)*

**<FN3>6C13713**

**19**

**<FN3>6C13714**

**20**

**<FN3>6C13715**

**21**

**<FN3>6C13716**

**22**

**<FN3>6C13717**

**23**

**<FN3>6C13718**

**24**

## *Code Lengths (continued)*

**<FN3>6C13719**

**25**

**<FN3>6C1371A**

**26**

**<FN3>6C1371B**

**27**

**<FN3>6C1371C**

**28**

**<FN3>6C1371D**

**29**

**<FN3>6C1371E**

**30**

## *Message Containing A Specific Data String*

Select whether the formatting affects data that begins with a specific character or data string, or contains a specific character or data string.

### Specific String at Start

To apply formatting to data that begins with a specific character or data string:

1. Scan the bar code below.
2. Enter a string representing the desired character or characters (up to a total of 8) using the *Alphanumeric Keyboard* beginning on page 3-84.
3. Scan **End Of Message** on page 3-93.

**<FN3>6C201**

**Specific String At Start**

### Specific String, Any Location

To apply formatting to data that contains a specific character or data string:

1. Scan the bar code below.
2. Scan a two-digit number representing the ***position*** (include a leading "zero" if necessary) using the *Numeric Keypad* on page 3-23.
3. Enter the desired character or characters (up to a total of 8) using the *Alphanumeric Keyboard* beginning on page 3-84.
4. Scan **End Of Message** on page 3-93.

**<FN3>6C200**

**Specific String Any Location**

### Any Message OK

By not scanning any bar code, all selected code types are formatted, regardless of information contained.

## *Numeric Keypad*

Bar codes on this page should not be confused with those on the alphanumeric keyboard.

**<FN3>A0**
**0**

**<FN3>A1**
**1**

**<FN3>A2**
**2**

**<FN3>A3**
**3**

**<FN3>A4**
**4**

**<FN3>A5**
**5**

**<FN3>A6**
**6**

**<FN3>A7**
**7**

**<FN3>A8**
**8**

**<FN3>A9**
**9**

**<FN3>A-**
**Cancel**

## *Rule Belongs To Set*

Scan a bar code below to select which set a rule belongs to.

**<FN3>6C12A1**

**Rule Belongs To Set 1**

**<FN3>6C12A2**

**Rule Belongs To Set 2**

**<FN3>6C12A3**

**Rule Belongs To Set 3**

**<FN3>6C12A4**

**Rule Belongs To Set 4**

# Actions

Select how to format the data meeting the defined criteria before transmission.

## *Send Data*

Use the following bar codes to send all data that remains, send all data up to a specific character selected from the *Alphanumeric Keyboard* on page 3-84, or send the next N characters. N = any number from 1 to 254, selected from the *Alphanumeric Keyboard* on page 3-84.

**<FN3>6A5211**

**Send Data Up To Character**

**<FN3>6A110**

**Send All Data That Remains**

**<FN3>6A141001**

**Send Next Character**

**<FN3>6A141002**

**Send Next 2 Characters**

**<FN3>6A141003**

**Send Next 3 Characters**

## *Send Data (continued)*

**<FN3>6A141004**

**Send Next 4 Characters**

**<FN3>6A141005**

**Send Next 5 Characters**

**<FN3>6A141006**

**Send Next 6 Characters**

**<FN3>6A141007**

**Send Next 7 Characters**

**<FN3>6A141008**

**Send Next 8 Characters**

**<FN3>6A141009**

**Send Next 9 Characters**

**<FN3>6A14100A**

**Send Next 10 Characters**

**<FN3>6A14100B**

**Send Next 11 Characters**

## *Send Data (continued)*

**<FN3>6A14100C**

**Send Next 12 Characters**

**<FN3>6A14100D**

**Send Next 13 Characters**

**<FN3>6A14100E**

**Send Next 14 Characters**

**<FN3>6A14100F**

**Send Next 15 Characters**

**<FN3>6A141010**

**Send Next 16 Characters**

**<FN3>6A141011**

**Send Next 17 Characters**

## *Send Data (continued)*

**<FN3>6A141012**

**Send Next 18 Characters**

**<FN3>6A141013**

**Send Next 19 Characters**

**<FN3>6A141014**

**Send Next 20 Characters**

**<FN3>6A141032**

**Send Next 50 Characters**

**<FN3>6A141064**

**Send Next 100 Characters**

**<FN3>6A141096**

**Send Next 150 Characters**

**<FN3>6A1410C8**

**Send Next 200 Characters**

**<FN3>6A1410FA**

**Send Next 250 Characters**

## Send Pause

**Send Pause**

## Setup Field(s)

Use the following bar codes to move the cursor in relation to a specified character.

---

**Note:** *If there is no match when the rule is interpreted and the rule fails, the next rule is checked.*

---

### Move Cursor To a Character

Scan the **Move Cursor To Character** bar code, then any printable ASCII character from the *Alphanumeric Keyboard* on page 3-84. This moves the cursor to the position after the matching character. If the character is not there, the rule fails and ADF tries the next rule.

**<FN3>6A5230**

**Move Cursor To Character**

### Move Cursor to Start of Data

Scan this bar code to move cursor to the beginning of the data.

**<FN3>6A1231**

**Move Cursor To Start**

## Move Cursor Past a Character

This parameter moves the cursor past all sequential occurrences of a selected character. Scan the **Move Cursor Past Character** bar code on page 3-30, then select a character from the *Alphanumeric Keyboard* on page 3-84. If the character is not there, the cursor does not move (i.e., has no effect).

**<FN3>6A5235**

**Move Cursor Past Character**

## Skip Ahead "N" Characters

Scan one of these bar codes to select the number of positions ahead you wish to move the cursor.

**<FN3>6A143301**

**Skip Ahead 1 Character**

**<FN3>6A143302**

**Skip Ahead 2 Characters**

**<FN3>6A143303**

**Skip Ahead 3 Characters**

**<FN3>6A143304**

**Skip Ahead 4 Characters**

## Skip Ahead (continued)

**<FN3>6A143305**

**Skip Ahead 5 Characters**

**<FN3>6A143306**

**Skip Ahead 6 Characters**

**<FN3>6A143307**

**Skip Ahead 7 Characters**

**<FN3>6A143308**

**Skip Ahead 8 Characters**

**<FN3>6A143309**

**Skip Ahead 9 Characters**

**<FN3>6A14330A**

**Skip Ahead 10 Characters**

## Skip Ahead (continued)

**<FN3>6A143332**

**Skip Ahead 50 Characters**

**<FN3>6A143364**

**Skip Ahead 100 Characters**

**<FN3>6A143396**

**Skip Ahead 150 Characters**

**<FN3>6A1433C8**

**Skip Ahead 200 Characters**

**<FN3>6A1433FA**

**Skip Ahead 250 Characters**

## Skip Back "N" Characters

Scan one of these bar codes to select the number of positions back you wish to move the cursor.

**<FN3>6A143401**

**Skip Back 1 Characters**

**<FN3>6A143402**

**Skip Back 2 Characters**

**<FN3>6A143403**

**Skip Back 3 Characters**

**<FN3>6A143404**

**Skip Back 4 Characters**

## Skip Back (continued)

**<FN3>6A143405**

**Skip Back 5 Characters**

**<FN3>6A143406**

**Skip Back 6 Characters**

**<FN3>6A143407**

**Skip Back 7 Character**

**<FN3>6A143408**

**Skip Back 8 Characters**

**<FN3>6A143409**

**Skip Back 9 Characters**

**<FN3>6A14340A**

**Skip Back 10 Characters**

## Skip Back (continued)

**<FN3>6A143432**

**Skip Back 50 Characters**

**<FN3>6A143464**

**Skip Back 100 Characters**

**<FN3>6A143496**

**Skip Back 150 Characters**

**<FN3>6A1434C8**

**Skip Back 200 Characters**

**<FN3>6A1434FA**

**Skip Back 250 Characters**

## Send Preset Value

Use these bar codes to send preset values.

**<FN3>6A1271**

**Send Value 1**

**<FN3>6A1272**

**Send Value 2**

## Modify Data

Modify data in the ways listed. The following actions work for all send commands that follow it within a rule. If you program *pad zeros to length 6, send next 3 characters, stop padding, send next 5 characters*, three zeros are added to the first send, and the next send is unaffected by the padding. These options do not apply to the **Send Keystroke** or **Send Preset Value** options.

### Remove All Spaces

To remove all spaces in the send commands that follow, scan this bar code.

**<FN3>6A1260**

**Remove All Spaces**

### Crunch All Spaces

To leave one space between words, scan this bar code. This also removes all leading and trailing spaces.

**<FN3>6A1261**

**Crunch All Spaces**

## Stop Space Removal

Scan this bar code to disable space removal.

**<FN3>6A1262**

**Stop Space Removal**

## Remove Leading Zeros

Scan this bar code to remove all leading zeros.

**<FN3>6A1264**

**Remove Leading Zeros**

## Stop Zero Removal

Scan this bar code to disable the removal of zeros.

**<FN3>6A1265**

**Stop Zero Removal**

## Pad Data With Spaces

To pad data to the left, scan the bar code containing the desired number of spaces. This parameter is activated by Send commands.

**<FN3>6A146301**

**Pad Spaces To Length 1**

**<FN3>6A146302**

**Pad Spaces To Length 2**

**<FN3>6A146303**

**Pad Spaces To Length 3**

**<FN3>6A146304**

**Pad Spaces To Length 4**

**<FN3>6A146305**

**Pad Spaces To Length 5**

**<FN3>6A146306**

**Pad Spaces To Length 6**

## Pad Data with Spaces (continued)

**<FN3>6A146307**

**Pad Spaces To Length 7**

**<FN3>6A146308**

**Pad Spaces To Length 8**

**<FN3>6A146309**

**Pad Spaces To Length 9**

**<FN3>6A14630A**

**Pad Spaces To Length 10**

**<FN3>6A14630B**

**Pad Spaces To Length 11**

**<FN3>6A14630C**

**Pad Spaces To Length 12**

## Pad Data with Spaces (continued)

**<FN3>6A14630D**

**Pad Spaces To Length 13**

**<FN3>6A14630E**

**Pad Spaces To Length 14**

**<FN3>6A14630F**

**Pad Spaces To Length 15**

**<FN3>6A146310**

**Pad Spaces To Length 16**

**<FN3>6A146311**

**Pad Spaces To Length 17**

**<FN3>6A146312**

**Pad Spaces To Length 18**

## Pad Data with Spaces (continued)

**<FN3>6A146313**

**Pad Spaces To Length 19**

**<FN3>6A146314**

**Pad Spaces To Length 20**

**<FN3>6A146315**

**Pad Spaces To Length 21**

**<FN3>6A146316**

**Pad Spaces To Length 22**

**<FN3>6A146317**

**Pad Spaces To Length 23**

**<FN3>6A146318**

**Pad Spaces To Length 24**

## Pad Data with Spaces (continued)

**<FN3>6A146319**

**Pad Spaces To Length 25**

**<FN3>6A14631A**

**Pad Spaces To Length 26**

**<FN3>6A14631B**

**Pad Spaces To Length 27**

**<FN3>6A14631C**

**Pad Spaces To Length 28**

**<FN3>6A14631D**

**Pad Spaces To Length 29**

**<FN3>6A14631E**

**Pad Spaces To Length 30**

**<FN3>6A146300**

**Stop Pad Spaces**

## Pad Data With Zeros

To pad data to the left, scan the bar code containing the desired number of zeros. This parameter is activated by Send commands. Use these bar codes to pad data with zeros.

**<FN3>6A146601**

**Pad Zeros To Length 1**

**<FN3>6A146602**

**Pad Zeros To Length 2**

**<FN3>6A146603**

**Pad Zeros To Length 3**

**<FN3>6A146604**

**Pad Zeros To Length 4**

**<FN3>6A146605**

**Pad Zeros To Length 5**

**<FN3>6A146606**

**Pad Zeros To Length 6**

## Pad Data With Zeros (continued)

**<FN3>6A146607**

**Pad Zeros To Length 7**

**<FN3>6A146608**

**Pad Zeros To Length 8**

**<FN3>6A146609**

**Pad Zeros To Length 9**

**<FN3>6A14660A**

**Pad Zeros To Length 10**

**<FN3>6A14660B**

**Pad Zeros To Length 11**

**<FN3>6A14660C**

**Pad Zeros To Length 12**

## Pad Data With Zeros (continued)

**<FN3>6A14660D**

**Pad Zeros To Length 13**

**<FN3>6A14660E**

**Pad Zeros To Length 14**

**<FN3>6A14660F**

**Pad Zeros To Length 15**

**<FN3>6A146610**

**Pad Zeros To Length 16**

**<FN3>6A146611**

**Pad Zeros To Length 17**

**<FN3>6A146612**

**Pad Zeros To Length 18**

## Pad Data With Zeros (continued)

**<FN3>6A146613**

**Pad Zeros To Length 19**

**<FN3>6A146614**

**Pad Zeros To Length 20**

**<FN3>6A146615**

**Pad Zeros To Length 21**

**<FN3>6A146616**

**Pad Zeros To Length 22**

**<FN3>6A146617**

**Pad Zeros To Length 23**

**<FN3>6A146618**

**Pad Zeros To Length 24**

## Pad Data With Zeros (continued)

**<FN3>6A146619**

**Pad Zeros To Length 25**

**<FN3>6A14661A**

**Pad Zeros To Length 26**

**<FN3>6A14661B**

**Pad Zeros To Length 27**

**<FN3>6A14661C**

**Pad Zeros To Length 28**

**<FN3>6A14661D**

**Pad Zeros To Length 29**

**<FN3>6A14661E**

**Pad Zeros To Length 30**

**<FN3>6A146600**

**Stop Pad Zeros**

## *Beeps*

Select a beep sequence for each ADF rule.

**<FN3>6A13A01**

**Beep Once**

**<FN3>6A13A02**

**Beep Twice**

**<FN3>6A13A03**

**Beep Three Times**

## *Send Keystroke (Control Characters and Keyboard Characters)*

Scan the "Send __" bar code for the keystroke you wish to send.

### Control Characters

Scan these bar codes to send control characters.

**<FN3>6A144100**

**Send Control 2**

**<FN3>6A144101**

**Send Control A**

**<FN3>6A144102**

**Send Control B**

**<FN3>6A144103**

**Send Control C**

**<FN3>6A144104**

**Send Control D**

**<FN3>6A144105**

**Send Control E**

## Control Characters (continued)

**<FN3>6A144106**

**Send Control F**

**<FN3>6A144107**

**Send Control G**

**<FN3>6A144108**

**Send Control H**

**<FN3>6A144109**

**Send Control I**

**<FN3>6A14410A**

**Send Control J**

**<FN3>6A14410B**

**Send Control K**

## Control Characters (continued)

**<FN3>6A14410C**

**Send Control L**

**<FN3>6A14410D**

**Send Control M**

**<FN3>6A14410E**

**Send Control N**

**<FN3>6A14410F**

**Send Control O**

**<FN3>6A144110**

**Send Control P**

**<FN3>6A144111**

**Send Control Q**

## Control Characters (continued)

**<FN3>6A144112**

**Send Control R**

**<FN3>6A144113**

**Send Control S**

**<FN3>6A144114**

**Send Control T**

**<FN3>6A144115**

**Send Control U**

**<FN3>6A144116**

**Send Control V**

**<FN3>6A144117**

**Send Control W**

**<FN3>6A144118**

**Send Control X**

## Control Characters (continued)

**<FN3>6A144119**

**Send Control Y**

**<FN3>6A14411A**

**Send Control Z**

**<FN3>6A14411B**

**Send Control [**

**<FN3>6A14411C**

**Send Control **

**<FN3>6A14411D**

**Send Control ]**

**<FN3>6A14411E**

**Send Control 6**

**<FN3>6A14411F**

**Send Control -**

## Keyboard Characters

Use these bar codes to send keyboard characters.

**<FN3>6A144120**

**Send Space**

**<FN3>6A144121**

**Send !**

**<FN3>6A144122**

**Send “**

**<FN3>6A144123**

**Send #**

**<FN3>6A144124**

**Send $**

**<FN3>6A144125**

**Send %**

**<FN3>6A144126**

**Send &**

**<FN3>6A144127**

**Send ‘**

## Keyboard Characters (continued)

**<FN3>6A144128**

**Send (**

**<FN3>6A144129**

**Send )**

**<FN3>6A14412A**

**Send ***

**<FN3>6A14412B**

**Send +**

**<FN3>6A14412C**

**Send ,**

**<FN3>6A14412D**

**Send -**

**<FN3>6A14412E**

**Send .**

**<FN3>6A14412F**

**Send /**

## Keyboard Characters (continued)

**<FN3>6A144130**

**Send 0**

**<FN3>6A144131**

**Send 1**

**<FN3>6A144132**

**Send 2**

**<FN3>6A144133**

**Send 3**

**<FN3>6A144134**

**Send 4**

**<FN3>6A144135**

**Send 5**

**<FN3>6A144136**

**Send 6**

**<FN3>6A144137**

**Send 7**

## Keyboard Characters (continued)

**<FN3>6A144138**

**Send 8**

**<FN3>6A144139**

**Send 9**

**<FN3>6A14413A**

**Send :**

**<FN3>6A14413B**

**Send ;**

**<FN3>6A14413C**

**Send <**

**<FN3>6A14413D**

**Send =**

**<FN3>6A14413E**

**Send >**

**<FN3>6A14413F**

**Send ?**

## Keyboard Characters (continued)

**<FN3>6A144140**

**Send @**

**<FN3>6A144141**

**Send A**

**<FN3>6A144142**

**Send B**

**<FN3>6A144143**

**Send C**

**<FN3>6A144144**

**Send D**

**<FN3>6A144145**

**Send E**

**<FN3>6A144146**

**Send F**

**<FN3>6A144147**

**Send G**

## Keyboard Characters (continued)

**<FN3>6A144148**

**Send H**

**<FN3>6A144149**

**Send I**

**<FN3>6A14414A**

**Send J**

**<FN3>6A14414B**

**Send K**

**<FN3>6A14414C**

**Send L**

**<FN3>6A14414D**

**Send M**

**<FN3>6A14414E**

**Send N**

**<FN3>6A14414F**

**Send O**

## Keyboard Characters (continued)

**<FN3>6A144150**

**Send P**

**<FN3>6A144151**

**Send Q**

**<FN3>6A144152**

**Send R**

**<FN3>6A144153**

**Send S**

**<FN3>6A144154**

**Send T**

**<FN3>6A144155**

**Send U**

**<FN3>6A144156**

**Send V**

**<FN3>6A144157**

**Send W**

## Keyboard Characters (continued)

**<FN3>6A144158**

**Send X**

**<FN3>6A144159**

**Send Y**

**<FN3>6A14415A**

**Send Z**

**<FN3>6A14415B**

**Send [**

**<FN3>6A14415C**

**Send **

**<FN3>6A14415D**

**Send ]**

**<FN3>6A14415E**

**Send ^**

**<FN3>6A14415F**

**Send _**

## Keyboard Characters (continued)

**<FN3>6A144160**

**Send ‘**

**<FN3>6A144161**

**Send a**

**<FN3>6A144162**

**Send b**

**<FN3>6A144163**

**Send c**

**<FN3>6A144164**

**Send d**

**<FN3>6A144165**

**Send e**

**<FN3>6A144166**

**Send f**

**<FN3>6A144167**

**Send g**

## Keyboard Characters (continued)

**<FN3>6A144168**

**Send h**

**<FN3>6A144169**

**Send i**

**<FN3>6A14416A**

**Send j**

**<FN3>6A14416B**

**Send k**

**<FN3>6A14416C**

**Send l**

**<FN3>6A14416D**

**Send m**

**<FN3>6A14416E**

**Send n**

**<FN3>6A14416F**

**Send o**

## Keyboard Characters (continued)

**<FN3>6A144170**

**Send p**

**<FN3>6A144171**

**Send q**

**<FN3>6A144172**

**Send r**

**<FN3>6A144173**

**Send s**

**<FN3>6A144174**

**Send t**

**<FN3>6A144175**

**Send u**

**<FN3>6A144176**

**Send v**

**<FN3>6A144177**

**Send w**

## Keyboard Characters (continued)

**<FN3>6A144178**

**Send x**

**<FN3>6A144179**

**Send y**

**<FN3>6A14417A**

**Send z**

**<FN3>6A14417B**

**Send {**

**<FN3>6A14417C**

**Send |**

**<FN3>6A14417D**

**Send }**

**<FN3>6A14417E**

**Send ~**

## Send ALT Characters

Use these bar codes to send ALT characters

**<FN3>6A144240**

**Send ALT 2**

**<FN3>6A144241**

**Send ALT A**

**<FN3>6A144242**

**Send ALT B**

**<FN3>6A144243**

**Send ALT C**

**<FN3>6A144244**

**Send ALT D**

**<FN3>6A144245**

**Send ALT E**

**<FN3>6A144246**

**Send ALT F**

**<FN3>6A144247**

**Send ALT G**

## Send ALT Characters (continued)

**<FN3>6A144248**

**Send ALT H**

**<FN3>6A144249**

**Send ALT I**

**<FN3>6A14424A**

**Send ALT J**

**<FN3>6A14424B**

**Send ALT K**

**<FN3>6A14424C**

**Send ALT L**

**<FN3>6A14424D**

**Send ALT M**

**<FN3>6A14424E**

**Send ALT N**

**<FN3>6A14424F**

**Send ALT O**

## Send ALT Characters (continued)

**<FN3>6A144250**

**Send ALT P**

**<FN3>6A144251**

**Send ALT Q**

**<FN3>6A144252**

**Send ALT R**

**<FN3>6A144253**

**Send ALT S**

**<FN3>6A144254**

**Send ALT T**

**<FN3>6A144255**

**Send ALT U**

**<FN3>6A144256**

**Send ALT V**

**S<FN3>6A144257**

**end ALT W**

## Send ALT Characters (continued)

**<FN3>6A144258**

**Send ALT X**

**<FN3>6A144259**

**Send ALT Y**

**<FN3>6A14425A**

**Send ALT Z**

**<FN3>6A14425B**

**Send ALT [**

**<FN3>6A14425C**

**Send ALT **

**<FN3>6A14425D**

**Send ALT ]**

**<FN3>6A14425E**

**Send ALT 6**

**<FN3>6A14425F**

**Send ALT -**

## Send Command Characters

**<FN3>6A144301**

**Send PA 1**

**<FN3>6A144302**

**Send PA 2**

**<FN3>6A144303**

**Send CMD 1**

**<FN3>6A144304**

**Send CMD 2**

**<FN3>6A144305**

**Send CMD 3**

**<FN3>6A144306**

**Send CMD 4**

## Send Command Characters (continued)

**<FN3>6A144307**

**Send CMD 5**

**<FN3>6A144308**

**Send CMD 6**

**<FN3>6A144309**

**Send CMD 7**

**<FN3>6A14430A**

**Send CMD 8**

**<FN3>6A14430B**

**Send CMD 9**

**<FN3>6A14430C**

**Send CMD 10**

## Send Special Characters

**<FN3>6A14430D**

**Send Yen Character**

**<FN3>6A14430E**

**Send Pound Sterling Character**

**<FN3>6A14430F**

**Send Bomb Character**

**<FN3>6A144310**

**Send Hook Character**

**<FN3>6A144311**

**Send Bullet Character**

**<FN3>6A144312**

**Send 1/2 Character**

**<FN3>6A144313**

**Send Paragraph Character**

**<FN3>6A144314**

**Send Section Character**

**<FN3>6A144315**

**Send Vertical Character**

## Send Keypad Characters

**<FN3>6A14462A**

**Send Keypad ***

**<FN3>6A14462B**

**Send Keypad +**

**<FN3>6A14462D**

**Send Keypad -**

**<FN3>6A14462E**

**Send Keypad .**

**<FN3>6A14462F**

**Send Keypad /**

**<FN3>6A144630**

**Send Keypad 0**

**<FN3>6A144631**

**Send Keypad 1**

**<FN3>6A144632**

**Send Keypad 2**

**<FN3>6A144633**

**Send Keypad 3**

**<FN3>6A144634**

**Send Keypad 4**

## Send Keypad Characters (continued)

**<FN3>6A144635**

**Send Keypad 5**

**<FN3>6A144636**

**Send Keypad 6**

**<FN3>6A144637**

**Send Keypad 7**

**<FN3>6A144638**

**Send Keypad 8**

**<FN3>6A144639**

**Send Keypad 9**

**<FN3>6A14463A**

**Send Keypad ENTER**

**<FN3>6A14463B**

**Send Keypad NUM LOCK**

## Send Keypad Characters (continued)

**<FN3>6A144701**

**Send Break Key**

**<FN3>6A144702**

**Send Delete Key**

**<FN3>6A144703**

**Send Page Up Key**

**<FN3>6A144704**

**Send End Key**

**<FN3>6A144705**

**Send Page Down Key**

**<FN3>6A144706**

**Send Pause Key**

**<FN3>6A144707**

**Send Scroll Lock Key**

**<FN3>6A144708**

**Send Backspace Key**

**<FN3>6A144709**

**Send Tab Key**

**<FN3>6A14470A**

**Send Print Screen Key**

## Send Keypad Characters (continued)

**<FN3>6A14470B**

**Send Insert Key**

**<FN3>6A14470C**

**Send Home Key**

**<FN3>6A14470D**

**Send Enter Key**

**<FN3>6A14470E**

**Send Escape Key**

**<FN3>6A14470F**

**Send Up Arrow Key**

**<FN3>6A144710**

**Send Down Arrow Key**

**<FN3>6A144711**

**Send Left Arrow Key**

**<FN3>6A144712**

**Send Right Arrow Key**

**<FN3>6A144713**

**Send Back Tab Character**

## Send Function Keys

**<FN3>6A144501**

**Send F1 Key**

**<FN3>6A144502**

**Send F2 Key**

**<FN3>6A144503**

**Send F3 Key**

**<FN3>6A144504**

**Send F4 Key**

**<FN3>6A144505**

**Send F5 Key**

**<FN3>6A144506**

**Send F6 Key**

**<FN3>6A144507**

**Send F7 Key**

**<FN3>6A144508**

**Send F8 Key**

**<FN3>6A144509**

**Send F9 Key**

**<FN3>6A14450A**

**Send F10 Key**

## Send Function Keys (continued)

**<FN3>6A14450B**

**Send F11 Key**

**<FN3>6A14450C**

**Send F12 Key**

**<FN3>6A14450D**

**Send F13 Key**

**<FN3>6A14450E**

**Send F14 Key**

**<FN3>6A14450F**

**Send F15 Key**

**<FN3>6A144510**

**Send F16 Key**

**<FN3>6A144511**

**Send F17 Key**

**<FN3>6A144512**

**Send F18 Key**

**<FN3>6A144513**

**Send F19 Key**

**<FN3>6A144514**

**Send F20 Key**

## Send Function Keys (continued)

**<FN3>6A144515**

**Send F21 Key**

**<FN3>6A144516**

**Send F22 Key**

**<FN3>6A144517**

**Send F23 Key**

**<FN3>6A144518**

**Send F24 Key**

**<FN3>6A144519**

**Send F25 Key**

**<FN3>6A14451A**

**Send F26 Key**

**<FN3>6A14451B**

**Send F27 Key**

**<FN3>6A14451C**

**Send F28 Key**

**<FN3>6A14451D**

**Send F29 Key**

**<FN3>6A14451E**

**Send F30 Key**

## Send Function Keys (continued)

**<FN3>6A144401**

**Send PF1 Key**

**<FN3>6A144402**

**Send PF2 Key**

**<FN3>6A144403**

**Send PF3 Key**

**<FN3>6A144404**

**Send PF4 Key**

**<FN3>6A144405**

**Send PF5 Key**

**<FN3>6A144406**

**Send PF6 Key**

**<FN3>6A144407**

**Send PF7 Key**

**<FN3>6A144408**

**Send PF8 Key**

**<FN3>6A144409**

**Send PF9 Key**

**<FN3>6A14440A**

**Send PF10 Key**

## Send Function Keys (continued)

**<FN3>6A14440B**

**Send PF11 Key**

**<FN3>6A14440C**

**Send PF12 Key**

**<FN3>6A14440D**

**Send PF13 Key**

**<FN3>6A14440E**

**Send PF14 Key**

**<FN3>6A14440F**

**Send PF15 Key**

**<FN3>6A144410**

**Send PF16 Key**

**<FN3>6A144411**

**Send PF17 Key**

**<FN3>6A144412**

**Send PF18 Key**

**<FN3>6A144413**

**Send PF19 Key**

**<FN3>6A144414**

**Send PF20 Key**

## Send Function Keys (continued)

**<FN3>6A144415**

**Send PF21 Key**

**<FN3>6A144416**

**Send PF22 Key**

**<FN3>6A144417**

**Send PF23 Key**

**<FN3>6A144418**

**Send PF24 Key**

**<FN3>6A144419**

**Send PF25 Key**

**<FN3>6A14441A**

**Send PF26 Key**

**<FN3>6A14441B**

**Send PF27 Key**

**<FN3>6A14441C**

**Send PF28 Key**

**<FN3>6A14441D**

**Send PF29 Key**

**<FN3>6A14441E**

**Send PF30 Key**

## Turn On/Off Rule Sets

Use these bar codes to turn rule sets on and off within a rule.

**<FN3>6A13911**

**Turn On Rule Set 1**

**<FN3>6A13921**

**Turn On Rule Set 2**

**<FN3>6A13931**

**Turn On Rule Set 3**

**<FN3>6A13941**

**Turn On Rule Set 4**

**<FN3>6A13910**

**Turn Off Rule Set 1**

**<FN3>6A13920**

**Turn Off Rule Set 2**

**<FN3>6A13930**

**Turn Off Rule Set 3**

**<FN3>6A13940**

**Turn Off Rule Set 4**

# Alphanumeric Keyboard

**<FN3>B20**

**Space**

**<FN3>B23**

**#**

**<FN3>B24**

**$**

**<FN3>B25**

**%**

**<FN3>B2A**

*****

**<FN3>B2B**

**+**

**<FN3>B2D**

**-**

**<FN3>B2E**

**.**

# Alphanumeric Keyboard (continued)

**<FN3>B2F**

**/**

**<FN3>B21**

**!**

**<FN3>B22**

**“**

**<FN3>B26**

**&**

**<FN3>B27**

**‘**

**<FN3>B28**

**(**

**<FN3>B29**

**)**

**<FN3>B3A**

**:**

# Alphanumeric Keyboard (continued)

**<FN3>B3B**

**;**

**<FN3>B3C**

**<**

**<FN3>B3D**

**=**

**<FN3>B3E**

**>**

**<FN3>B3F**

**?**

**<FN3>B40**

**@**

# Alphanumeric Keyboard (continued)

**<FN3>B5B**

**[**

**<FN3>B5C**

****

**<FN3>B5D**

**]**

**<FN3>B5E**

**^**

**<FN3>B5F**

**_**

**<FN3>B60**

**`**

# Alphanumeric Keyboard (continued)

Bar codes on this page should not be confused with those on the numeric keypad.

**<FN3>B30**

**0**

**<FN3>B31**

**1**

**<FN3>B32**

**2**

**<FN3>B33**

**3**

**<FN3>B34**

**4**

**<FN3>B35**

**5**

# Alphanumeric Keyboard (continued)

Bar codes on this page should not be confused with those on the numeric keypad.

**<FN3>B36**

**6**

**<FN3>B37**

**7**

**<FN3>B38**

**8**

**<FN3>B39**

**9**

# Alphanumeric Keyboard (continued)

**<FN3>B41**

**A**

**<FN3>B42**

**B**

**<FN3>B43**

**C**

**<FN3>B44**

**D**

**<FN3>B45**

**E**

**<FN3>B46**

**F**

**<FN3>B47**

**G**

**<FN3>B48**

**H**

# Alphanumeric Keyboard (continued)

**<FN3>B49**

**I**

**<FN3>B4A**

**J**

**<FN3>B4B**

**K**

**<FN3>B4C**

**L**

**<FN3>B4D**

**M**

**<FN3>B4E**

**N**

**<FN3>B4F**

**O**

**<FN3>B50**

**P**

# Alphanumeric Keyboard (continued)

**<FN3>B51**

**Q**

**<FN3>B52**

**R**

**<FN3>B53**

**S**

**<FN3>B54**

**T**

**<FN3>B55**

**U**

**<FN3>B56**

**V**

# Alphanumeric Keyboard (continued)

**<FN3>B57**

**W**

**<FN3>B58**

**X**

**<FN3>B59**

**Y**

**<FN3>B5A**

**Z**

**<FN3>B-**

**Cancel**

**<FN3>B+**

**End Of Message**

# Alphanumeric Keyboard (continued)

**<FN3>B61**

**a**

**<FN3>B62**

**b**

**<FN3>B63**

**c**

**<FN3>B64**

**d**

**<FN3>B65**

**e**

**<FN3>B66**

**f**

**<FN3>B67**

**g**

**<FN3>B68**

**h**

# Alphanumeric Keyboard (continued)

**<FN3>B69**

**i**

**<FN3>B6A**

**j**

**<FN3>B6B**

**k**

**<FN3>B6C**

**l**

**<FN3>B6D**

**m**

**<FN3>B6E**

**n**

**<FN3>B6F**

**o**

**<FN3>B70**

**p**

# Alphanumeric Keyboard (continued)

**<FN3>B71**

**q**

**<FN3>B72**

**r**

**<FN3>B73**

**s**

**<FN3>B74**

**t**

**<FN3>B75**

**u**

**<FN3>B76**

**v**

**<FN3>B77**

**w**

**<FN3>B78**

**x**

# Alphanumeric Keyboard (continued)

**<FN3>B79**

**y**

**<FN3>B7A**

**z**

**<FN3>B7B**

**{**

**<FN3>B7C**

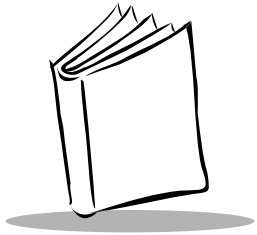
**|**

**<FN3>B7D**

**}**

**<FN3>B7E**

**~**



# *Chapter 4*
# *Maintenance and Troubleshooting*

## Maintenance

Cleaning the scanner exit window is the only maintenance required.

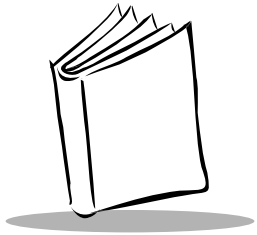
- Do not allow any abrasive material to touch the window.
- Remove any dirt particles with a damp cloth.
- Wipe the window using a damp cloth, and if necessary, a non-ammonia based detergent.

# Troubleshooting

**Table 4-1. Troubleshooting**

| Problem | Possible Cause | Possible Solutions |
|---|---|---|
| Nothing happens when you follow the operating instructions. | No power to the scanner. | Check the system power. Ensure the power supply is connected if your configuration requires a power supply. |
| | Scanner is not programmed for the correct host. | Be sure the scanner is programmed for the terminal in use. |
| | Scanner is not programmed for the correct bar code type. | Be sure the scanner is programmed to read the type of bar code you are scanning. |
| | Interface/power cables are loose. | Check for loose cable connections. |
| | Bar code symbol is unreadable. | Check the symbol to make sure it is not defaced. Try scanning test symbols of the same bar code type. |
| Symbol is decoded, but not transmitted to the host terminal. | Scanner is not programmed for the correct host type. | Be sure the proper host type is selected. (See Chapter 2, *Programming the Scanner*.) |
| Scanned data is incorrectly displayed on the terminal. | Scanner is programmed to work with the wrong keyboard type. | For a keyboard wedge configuration, ensure the system is programmed for the correct keyboard type, and the CAPS LOCK key is off. |
| | RS-232 host setup is wrong. | Ensure the scanner's communication paraneters match the host terminal's settings. |
| | Scanner is programmed to work with the wrong host type. | Be sure the proper host is selected. |
| | Scanner is programmed with the wrong editing options. | Be sure editing options (e.g., UPC-E to UPC-A Conversion) are properly programmed. |

**Note:** *If, after performing these checks, the problem is not corrected, contact your distributor or call the Symbol Support Centers. See Service Information on page x for contact information.*



# *Appendix A*
# *Programming Reference*

## UCC/EAN-128

UCC/EAN-128 is a convention for printing data fields with standard Code 128 bar code symbols. UCC/EAN-128 symbols are distinguished by a leading FNC 1 character as the first or second character in the symbol. Other FNC 1 characters are used to delineate fields.

When EAN-128 symbols are read, they are transmitted after special formatting strips off the leading FNC 1 character and replaces other FNC 1 characters with the ASCII 29 GS control character.

When AIM symbology identifiers are transmitted, the modifier character indicates the position of the leading FNC 1 character according to AIM guidelines. For example, ]**c1** indicates a UCC/EAN-128 symbol with a leading FNC1 character.

Standard Code 128 bar codes which do not have a leading FNC 1 may still be used but are not encoded according to the EAN-128 convention. Standard Code 128 and UCC/EAN-128 may be mixed in an application. The P 300FZY and P 300PRO scanner autodiscriminates between these symbols, and can enable or disable one or both code types via bar code menus. Table A-1 indicates the behavior of the P 300FZY and P 300PRO in each of the possible parameter settings.

**Table A-1. Reading Standard Code128 & UCC/EAN 128**

| Standard Code 128 | UCC/EAN-128 | Effect and Example |
|---|---|---|
| Disable | Disable | No Code 128 symbols can be read. |
| Disable | Enable | Read only symbols with leading FNC 1.<br>Examples:<br>$^{FNC1}$ABCD$^{FNC1}$E are read as ABCD$^{29}$E<br>A$^{FNC1}$BCD$^{FNC1}$E are read as ABCD$^{29}$E<br>$^{FNC1FNC1}$ABCD$^{FNC1}$E are read as ABCD$^{29}$E<br>ABCD$^{FNC1}$E cannot be read<br>ABCDE cannot be read |
| Enable | Disable | Read only symbols without leading FNC 1.<br>Examples:<br>$^{FNC1}$ABCD$^{FNC1}$E cannot be read<br>A$^{FNC1}$BCD$^{FNC1}$E cannot be read<br>$^{FNC1FNC1}$ABCD$^{FNC1}$E cannot be read<br>ABCD$^{FNC1}$E is read as ABCD$^{29}$E<br>ABCDE is read as ABCDE |
| Enable | Enable | Read both types of symbols.<br>Examples:<br>$^{FNC1}$ABCD$^{FNC1}$E are read as ABCD$^{29}$E<br>A$^{FNC1}$BCD$^{FNC1}$E are read as ABCD$^{29}$E<br>$^{FNC1FNC1}$ABCD$^{FNC1}$E are read as ABCD$^{29}$E<br>ABCD$^{FNC1}$E is read as ABCD$^{29}$E<br>ABCDE is read as ABCDE |

# AIM Code Identifiers

Each AIM Code Identifier contains the three-character string **]cm** where:

] = Flag Character (ASCII 93)
c = Code Character (see Table A-2)
m = Modifier Character (see Table A-3)

**Table A-2. AIM Code Identifiers**

| Code Identifiers | Code Type |
|---|---|
| A | Code 39 |
| C | Code 128 |
| E | UPC/EAN |
| F | Codabar |
| G | Code 93 |
| H | Code 11 |
| I | Interleaved 2 of 5 |
| L | PDF417 |
| M | MSI Plessey |
| S | D2 of 5, IATA 2 of 5 |
| X | Code 39 Trioptic |
| X | Bookland EAN |
| X | Coupon Code |

The modifier character is the sum of the applicable option values based on Table A-3.

**Table A-3. Modifier Characters**

| Code Type | Option Value | Option |
|---|---|---|
| **Code 39** | 0 | No check character or Full ASCII processing. |
| | 1 | Reader has checked one check character. |
| | 3 | Reader has checked and stripped check character. |
| | 4 | Reader has performed Full ASCII character conversion. |
| | 5 | Reader has performed Full ASCII character conversion and checked one check character. |
| | 7 | Reader has performed Full ASCII character conversion and checked and stripped check character. |
| | Example: A Full ASCII bar code with check character W, **A+I+MI+DW**, is transmitted as ]**A7**AimId where 7 = (3+4). | |
| **Trioptic Code 39** | 0 | No option specified at this time. Always transmit 0. |
| | Example: A Trioptic bar code 412356 is transmitted as ]**X0**412356 | |
| **Code 128** | 0 | Standard data packet, no Function code 1 in first symbol position. |
| | 1 | Function code 1 in first symbol character position. |
| | 2 | Function code 1 in second symbol character position. |
| | Example: A Code (EAN) 128 bar code with Function 1 character in the first position, **FNC1** Aim Id is transmitted as **]C1**AimId | |
| **I 2 of 5** | 0 | No check digit processing. |
| | 1 | Reader has validated check digit. |
| | 3 | Reader has validated and stripped check digit. |
| | Example: An I 2 of 5 bar code without check digit, 4123, is transmitted as ]**I0**4123 | |
| **Codabar** | 0 | No check digit processing. |
| | 1 | Reader has checked check digit. |
| | 3 | Reader has stripped check digit before transmission. |
| | Example: A Codabar bar code without check digit, 4123, is transmitted as ]**F0**4123 | |

**Table A-3. Modifier Characters (Continued)**

| Code Type | Option Value | Option |
|---|---|---|
| **Code 93** | | |
| | 0 | No options specified at this time. Always transmit 0. |
| | Example: A Code 93 bar code 012345678905 is transmitted as ]G0012345678905 | |
| **MSI Plessey** | 0 | Single check digit checked. |
| | 1 | Two check digits checked. |
| | 2 | Single check digit verified and stripped before transmission. |
| | 3 | Two check digits verified and stripped before transmission. |
| | Example: An MSI Plessey bar code 4123, with a single check digit checked, is transmitted as ]M04123 | |
| **D 2 of 5** | 0 | No options specified at this time. Always transmit 0. |
| | Example: A D 2 of 5 bar code 4123, is transmitted as ]S04123 | |
| **UPC/EAN** | 0 | Standard packet in full EAN country code format, which is 13 digits for UPC-A and UPC-E (not including supplemental data). |
| | 1 | Two-digit supplement data only. |
| | 2 | Five-digit supplement data only. |
| | 4 | EAN-8 data packet. |
| | Example: A UPC-A bar code 012345678905 is transmitted as ]E00012345678905 | |
| **Bookland EAN** | 0 | No options specified at this time. Always transmit 0. |
| | Example: A Bookland EAN bar code 123456789X is transmitted as ]X0123456789X | |

# Prefix / Suffix Values

The following values can be assigned as prefixes or suffixes for ASCII character data transmission. If you're using a keyboard interface, refer to the *Synapse "Smart Cable" Interface Guide* for keystroke prefix/suffix values.

**Table A-4. Prefix/Suffix Values**

| Prefix/Suffix Value | Full ASCII Code 39 Encode Char. | ASCII Character | Prefix/Suffix Value | Full ASCII Code 39 Encode Char. | ASCII Character |
|---|---|---|---|---|---|
| 1000 | %U | NUL | 1030 | %D | RS |
| 1001 | $A | SOH | 1031 | %E | US |
| 1002 | $B | STX | 1032 | Space | Space |
| 1003 | $C | ETX | 1033 | /A | ! |
| 1004 | $D | EOT | 1034 | /B | " |
| 1005 | $E | ENQ | 1035 | /C | # |
| 1006 | $F | ACK | 1036 | /D | $ |
| 1007 | $G | BELL | 1037 | /E | % |
| 1008 | $H | BCKSPC | 1038 | /F | & |
| 1009 | $I | HORIZ TAB | 1039 | /G | ‘ |
| 1010 | $J | LF/NW LN | 1040 | /H | ( |
| 1011 | $K | VT | 1041 | /I | ) |
| 1012 | $L | FF | 1042 | /J | * |
| 1013 | $M | CR/ENTER | 1043 | /K | + |
| 1014 | $N | SO | 1044 | /L | , |
| 1015 | $O | SI | 1045 | - | - |
| 1016 | $P | DLE | 1046 | . | . |
| 1017 | $Q | DC1 | 1047 | / | / |
| 1018 | $R | DC2 | 1048 | 0 | 0 |
| 1019 | $S | DC3 | 1049 | 1 | 1 |
| 1020 | $T | DC4 | 1050 | 2 | 2 |
| 1021 | $U | NAK | 1051 | 3 | 3 |
| 1022 | $V | SYN | 1052 | 4 | 4 |
| 1023 | $W | ETB | 1053 | 5 | 5 |
| 1024 | $X | CAN | 1054 | 6 | 6 |
| 1025 | $Y | EM | 1057 | 7 | 7 |
| 1026 | $Z | SUB | 1056 | 8 | 8 |
| 1027 | %A | ESC | 1057 | 9 | 9 |
| 1028 | %B | FS | 1058 | /Z | : |
| 1029 | %C | GS | 1059 | %F | ; |

**Table A-3. Prefix/Suffix Values (continued)**

| Prefix/Suffix Value | Full ASCII Code 39 Encode Char. | ASCII Character | Prefix/Suffix Value | Full ASCII Code 39 Encode Char. | ASCII Character |
|---|---|---|---|---|---|
| 1060 | %G | < | 1095 | %O | _ |
| 1061 | %H | = | 1096 | %W | ` |
| 1062 | %I | > | 1097 | +A | a |
| 1063 | %J | ? | 1098 | +B | b |
| 1064 | %V | @ | 1099 | +C | c |
| 1065 | A | A | 1100 | +D | d |
| 1066 | B | B | 1101 | +E | e |
| 1067 | C | C | 1102 | +F | f |
| 1068 | D | D | 1103 | +G | g |
| 1069 | E | E | 1104 | +H | h |
| 1070 | F | F | 1105 | +I | i |
| 1071 | G | G | 1106 | +J | j |
| 1072 | H | H | 1107 | +K | k |
| 1073 | I | I | 1108 | +L | l |
| 1074 | J | J | 1109 | +M | m |
| 1075 | K | K | 1110 | +N | n |
| 1076 | L | L | 1111 | +O | o |
| 1077 | M | M | 1112 | +P | p |
| 1078 | N | N | 1113 | +Q | q |
| 1079 | O | O | 1114 | +R | r |
| 1080 | P | P | 1115 | +S | s |
| 1081 | Q | Q | 1116 | +T | t |
| 1082 | R | R | 1117 | +U | u |
| 1083 | S | S | 1118 | +V | v |
| 1084 | T | T | 1119 | +W | w |
| 1085 | U | U | 1120 | +X | x |
| 1086 | V | V | 1121 | +Y | y |
| 1087 | W | W | 1122 | +Z | z |
| 1088 | X | X | 1123 | %P | { |
| 1089 | Y | Y | 1124 | %Q | \| |
| 1090 | Z | Z | 1125 | %R | } |
| 1091 | %K | [ | 1126 | %S | ~ |
| 1092 | %L | \ | 1127 | | Undefined |
| 1093 | %M | ] | | | |
| 1094 | %N | ^ | 7013 | | ENTER |

# Appendix B
# Keyboard Maps

The keyboard maps on the following pages are provided for prefix/suffix keystroke parameters, and are used only with scanners that support data formatting. To program the prefix/suffix values, see the bar codes on page 2-96.

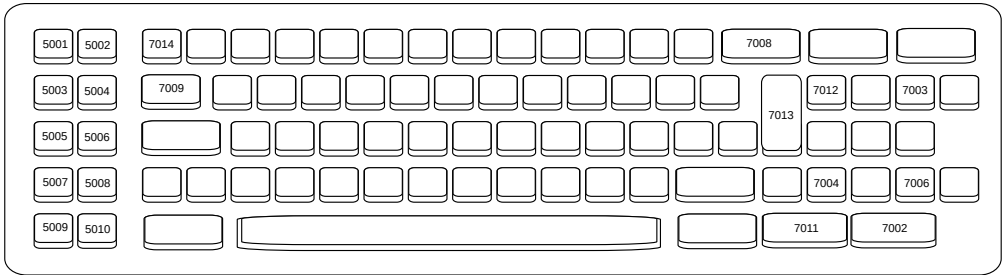



**Figure B-1. IBM PC/XT Keyboard**

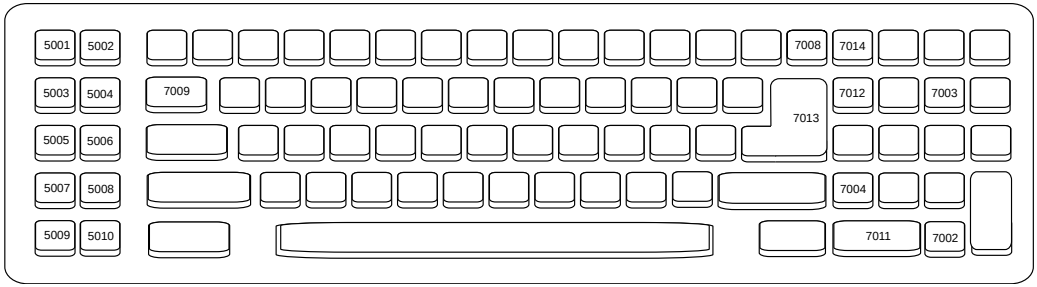



**Figure B-2. IBM PC/AT Keyboard**

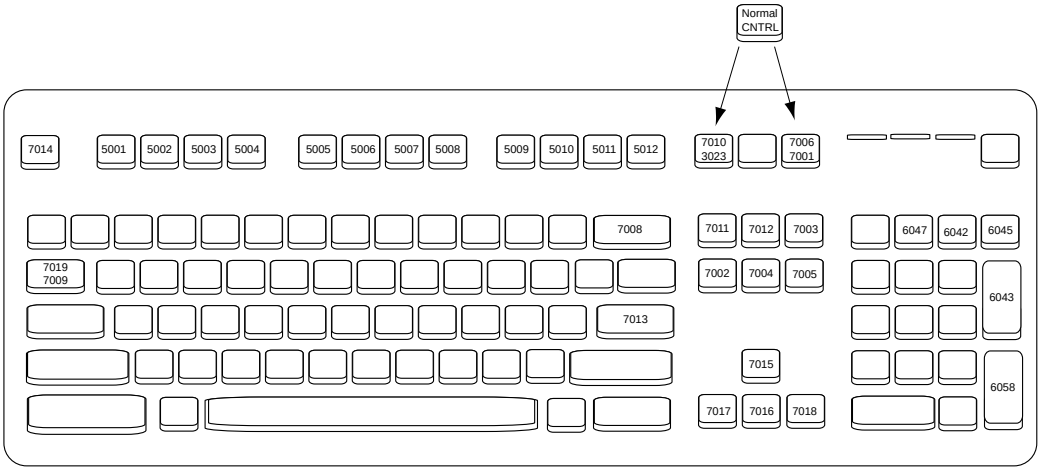



**Figure B-3. IBM PS2 Keyboard**

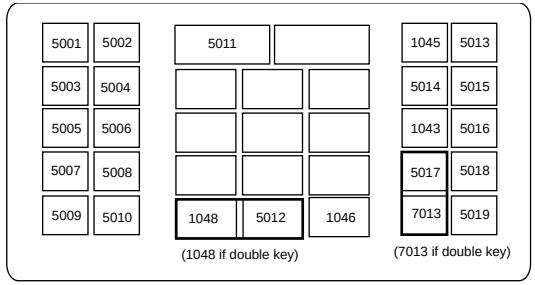



**Figure B-4. NCR 7052 32-Key Keyboard**

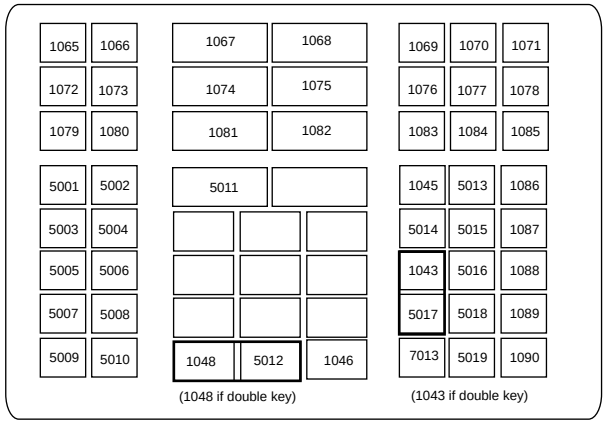
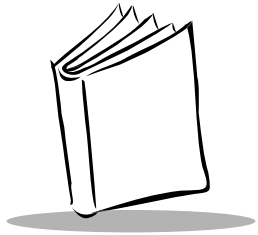



**Figure B-5. NCR 7052 58-Key Keyboard**



# *Appendix C*
# *ASCII Character Set*

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

| ASCII Value | Full ASCII Code 39 Encode Char. | Keystroke |
|---|---|---|
| 1000 | %U | CTRL 2 |
| 1001 | $A | CTRL A |
| 1002 | $B | CTRL B |
| 1003 | $C | CTRL C |
| 1004 | $D | CTRL D |
| 1005 | $E | CTRL E |
| 1006 | $F | CTRL F |
| 1007 | $G | CTRL G |
| 1008 | $H | CTRL H |
| 1009 | $I | CTRL I |
| 1010 | $J | CTRL J |
| 1011 | $K | CTRL K |
| 1012 | $L | CTRL L |
| 1013 | $M | CTRL M |

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

| | | |
|---|---|---|
| 1014 | $N | CTRL N |
| 1015 | $O | CTRL O |
| 1016 | $P | CTRL P |
| 1017 | $Q | CTRL Q |
| 1018 | $R | CTRL R |
| 1019 | $S | CTRL S |
| 1020 | $T | CTRL T |
| 1021 | $U | CTRL U |
| 1022 | $V | CTRL V |
| 1023 | $W | CTRL W |
| 1024 | $X | CTRL X |
| 1025 | $Y | CTRL Y |
| 1026 | $Z | CTRL Z |
| 1027 | %A | CTRL [ |
| 1028 | %B | CTRL \ |
| 1029 | %C | CTRL ] |
| 1030 | %D | CTRL 6 |
| 1031 | %E | CTRL - |
| 1032 | Space | Space |
| 1033 | /A | ! |
| 1034 | /B | ‘ |
| 1035 | /C | # |
| 1036 | /D | E |
| 1037 | /E | % |
| 1038 | /F | & |
| 1039 | /G | ‘ |
| 1040 | /H | ( |

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

| | | |
|---|---|---|
| 1041 | /I | ) |
| 1042 | /J | * |
| 1043 | /K | + |
| 1044 | /L | , |
| 1045 | - | - |
| 1046 | . | . |
| 1047 | / | / |
| 1048 | 0 | 0 |
| 1047 | 1 | 1 |
| 1050 | 2 | 2 |
| 1051 | 3 | 3 |
| 1052 | 4 | 4 |
| 1053 | 5 | 5 |
| 1054 | 6 | 6 |
| 1055 | 7 | 7 |
| 1056 | 8 | 8 |
| 1057 | 9 | 9 |
| 1058 | /Z | : |
| 1059 | %F | ; |
| 1060 | %G | < |
| 1061 | %H | = |
| 1062 | %I | > |
| 1063 | %J | ? |
| 1064 | %V | @ |
| 1065 | A | A |
| 1066 | B | B |
| 1067 | C | C |

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

| | | |
|---|---|---|
| 1068 | D | D |
| 1069 | E | E |
| 1070 | F | F |
| 1071 | G | G |
| 1072 | H | H |
| 1073 | I | I |
| 1074 | J | J |
| 1075 | K | K |
| 1076 | L | L |
| 1077 | M | M |
| 1078 | N | N |
| 1079 | O | O |
| 1080 | P | P |
| 1081 | Q | Q |
| 1082 | R | R |
| 1083 | S | S |
| 1084 | T | T |
| 1085 | U | U |
| 1086 | V | V |
| 1087 | W | W |
| 1088 | X | X |
| 1089 | Y | Y |
| 1090 | Z | Z |
| 1091 | %K | [ |
| 1092 | %L | \ |
| 1093 | %M | ] |
| 1094 | %N | ^ |

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

| | | |
|---|---|---|
| 1095 | %O | _ |
| 1096 | %W | ‘ |
| 1097 | +A | a |
| 1098 | +B | b |
| 1099 | +C | c |
| 1100 | +D | d |
| 1101 | +E | e |
| 1102 | +F | f |
| 1103 | +G | g |
| 1104 | +H | h |
| 1105 | +I | i |
| 1106 | +J | j |
| 1107 | +K | k |
| 1108 | +L | l |
| 1109 | +M | m |
| 1110 | +N | n |
| 1111 | +O | o |
| 1112 | +P | p |
| 1113 | +Q | q |
| 1114 | +R | r |
| 1115 | +S | s |
| 1116 | +T | t |
| 1117 | +U | u |
| 1118 | +V | v |
| 1119 | +W | w |
| 1120 | +X | x |
| 1121 | +Y | y |

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

| | | |
|---|---|---|
| 1122 | +Z | z |
| 1123 | %P | { |
| 1124 | %Q | \| |
| 1125 | %R | } |
| 1126 | %S | ~ |
| 1127 | | Undefined |
| 1128 | | |
| **ALT Keys** | **Keystroke** | |
| 2064 | ALT 2 | |
| 2065 | ALT A | |
| 2066 | ALT B | |
| 2067 | ALT C | |
| 2068 | ALT D | |
| 2069 | ALT E | |
| 2070 | ALT F | |
| 2071 | ALT G | |
| 2072 | ALT H | |
| 2073 | ALT I | |
| 2074 | ALT J | |
| 2075 | ALT K | |
| 2076 | ALT L | |
| 2077 | ALT M | |
| 2078 | ALT N | |
| 2079 | ALT O | |
| 2080 | ALT P | |
| 2081 | ALT Q | |
| 2082 | ALT R | |

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

| | |
|---|---|
| 2083 | ALT S |
| 2084 | ALT T |
| 2085 | ALT U |
| 2086 | ALT V |
| 2087 | ALT W |
| 2088 | ALT X |
| 2089 | ALT Y |
| 2090 | ALT Z |
| 2091 | ALT [ |
| 2092 | ALT \ |
| 2093 | ALT ] |
| 2094 | ALT 6 |
| 2095 | ALT - |
| **Misc. Key** | **Keystroke** |
| 3001 | PA 1 |
| 3002 | PA 2 |
| 3003 | CMD 1 |
| 3004 | CMD 2 |
| 3005 | CMD 3 |
| 3006 | CMD 4 |
| 3007 | CMD 5 |
| 3008 | CMD 6 |
| 3009 | CMD 7 |
| 3010 | CMD 8 |
| 3011 | CMD 9 |
| 3012 | CMD 10 |
| 3013 | ¥ |

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

| | |
|---|---|
| 3014 | £ |
| 3015 | ¤ |
| 3016 | ¬ |
| 3017 | ° |
| 3018 | 1/2 |
| 3019 | ¶ |
| 3020 | § |
| 3021 | \| |
| 3022 | 0/00 |
| **PF Keys** | **Keystrokes** |
| 4001 | PF 1 |
| 4002 | PF 2 |
| 4003 | PF 3 |
| 4004 | PF 4 |
| 4005 | PF 5 |
| 4006 | PF 6 |
| 4007 | PF 7 |
| 4008 | PF 8 |
| 4009 | PF 9 |
| 4010 | PF 10 |
| 4011 | PF 11 |
| 4012 | PF 12 |
| 4013 | PF 13 |
| 4014 | PF 14 |
| 4015 | PF 15 |
| 4016 | PF 16 |
| 4017 | PF 17 |

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

| | |
|---|---|
| 4018 | PF 18 |
| 4019 | PF 19 |
| 4020 | PF 20 |
| 4021 | PF 21 |
| 4022 | PF 22 |
| 4023 | PF 23 |
| 4024 | PF 24 |
| **F Keys** | **Keystroke** |
| 5001 | F1 |
| 5002 | F2 |
| 5003 | F3 |
| 5004 | F4 |
| 5005 | F5 |
| 5006 | F6 |
| 5007 | F7 |
| 5008 | F8 |
| 5009 | F9 |
| 5010 | F10 |
| 5011 | F11 |
| 5012 | F12 |
| 5013 | F13 |
| 5014 | F14 |
| 5015 | F15 |
| 5016 | F16 |
| 5017 | F17 |
| 5018 | F18 |
| 5019 | F19 |

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

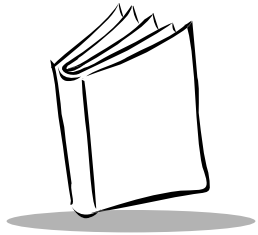
| | |
|---|---|
| 5020 | F20 |
| 5021 | F21 |
| 5022 | F22 |
| 5023 | F23 |
| 5024 | F24 |
| 5025 | F25 |
| 5026 | F26 |
| 5027 | F27 |
| 5028 | F28 |
| 5029 | F29 |
| 5030 | F30 |
| 5031 | F31 |
| 5032 | F32 |
| 5033 | F33 |
| 5034 | F34 |
| 5035 | F35 |
| 5036 | F36 |
| 5037 | F37 |
| 5038 | F38 |
| 5039 | F39 |
| 5040 | F40 |
| | |
| **Numeric Keypad** | **Keystroke** |
| 6042 | * |
| 6043 | + |
| 6044 | undefined |
| 6045 | - |

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

| | |
|---|---|
| 6046 | . |
| 6047 | / |
| 6048 | 0 |
| 6049 | 1 |
| 6050 | 2 |
| 6051 | 3 |
| 6052 | 4 |
| 6053 | 5 |
| 6054 | 6 |
| 6055 | 7 |
| 6056 | 8 |
| 6057 | 9 |
| 6058 | Enter |
| 6059 | Num Lock |
| 6060 | 00 |
| **Extended Keypad** | **Keystroke** |
| 7001 | Break |
| 7002 | Delete |
| 7003 | Pg Up |
| 7004 | End |
| 7005 | Pg Dn |
| 7006 | Pause |
| 7007 | Scroll Lock |
| 7008 | Backspace |
| 7009 | Tab |
| 7010 | Print Screen |
| 7011 | Insert |

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

| | |
|---|---|
| 7012 | Home |
| 7013 | Enter |
| 7014 | Escape |
| 7015 | Up Arrow |
| 7016 | Dn Arrow |
| 7017 | Left Arrow |
| 7018 | Right Arrow |
| 7019 | Back Tab |



# Appendix D
# Technical Specifications

**Table D-1. Technical Specifications**

| Item | Description |
|---|---|
| **Power Requirements*** | |
| **PC Wedge/Synapse** | 4.5 to 5.5 VDC (max) 200 mA @ 5V typical |
| **RS-232C/Synapse** | 4.5 to 5.5 VDC (max) 190 mA @ 5V typical |
| **Low Power** | 4.5 to 5.5 VDC (max) 400 mA @ 5V typical |
| **Decode Capability** | The P 300FZY and P 300PRO can be programmed to decode the following code types: UPC/EAN, Bookland EAN, Code 39, Code 39 Full ASCII, Trioptic Code 39, Code 93, Codabar, Interleaved 2 of 5, Code 128, EAN 128, Discrete 2 of 5, MSI Plessey, and PDF417. Set code length(s) for any linear code type. The P 300FZY and 300PRO can auto-discriminate between all of the above code types except for Code 39 and Code 39 Full ASCII. Transmission of decoded information depends on the capabilities of the attached terminal. |
| **Beeper Operation** | User-selectable: Enabled, Disabled |
| **Scan Repetition Rate** | 36 scans/sec |
| **Scan Angle** | ±37° |
| **Roll (Skew) Tolerance** | ±45° from normal |
| **Pitch** | ±60° from normal |
| **Yaw** | ±30° from normal |
| **1-D Decode Depth of Field** | See *P 300STD Decode Zone* on page D-3 |

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

| Item | Description |
|---|---|
| **2-D Decode Depth of Field** | See *P 300FZY Decode Zone* on page D-4 |
| **Print Contrast Minimum** | MRD 25% absolute dark/light differential, measured at 650 nm. |
| *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. | |
| **Ambient Light Immunity**<br>**Artificial Lighting**<br>**Sunlight** | <br>450 ft. candles 4844 lux<br>9000 ft. candles 96876 lux<br>(@8 in. (20 cm) on low density bar codes) |
| **Operating Temperature** | -30° to 50°C (STD/FZY -20° to 50°C (PRO) |
| **Storage Temperature** | -40° to 140°F -40° to 60°C |
| **Humidity** | 5% to95% (non-condensing) |
| **Durability** | 6-ft. drop to concrete 1.8 m |
| **Dimensions**<br>**Height**<br>**Length**<br>**Width** | <br>7.0 in. 17.80 cm<br>9.2in. 13.50 cm<br>3.5 in. 9.80 cm |
| **Laser Classifications** | CDRH Class II<br>IEC 825 Class 2 |
| **Laser Power** | 0.81 mW ±0.07mW |

# P 300STD Decode Zone

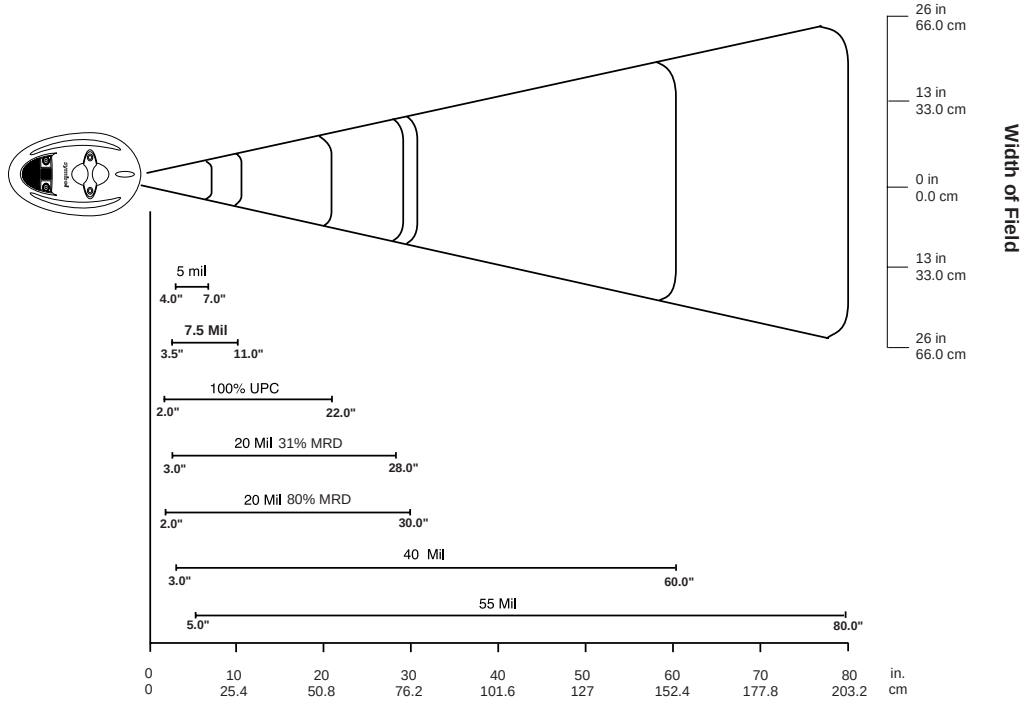



**Figure D-1. P 300STD Decode Zone**

# P 300FZY Decode Zone

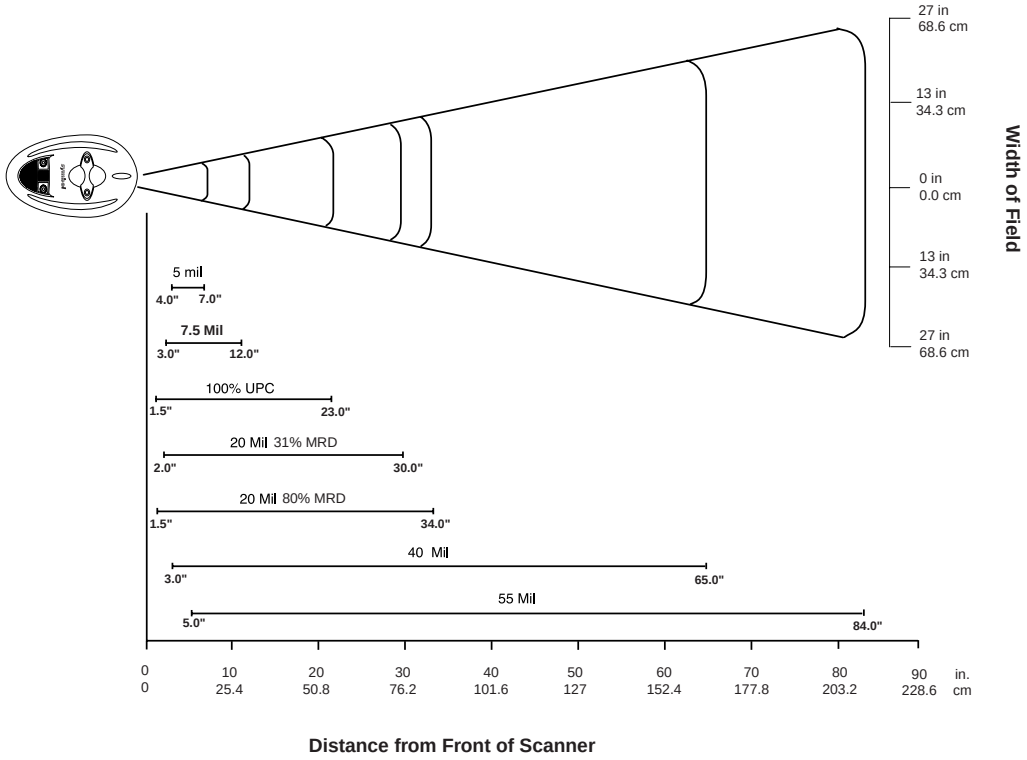



**Figure D-2. P 300FZY Decode Zone**

**Note:** *The measurements above are for 6.6 mil, 100 character PDF bar code and 15 mil, 64 character PDF bar code.*

# P 300PRO 1-D Decode Zone

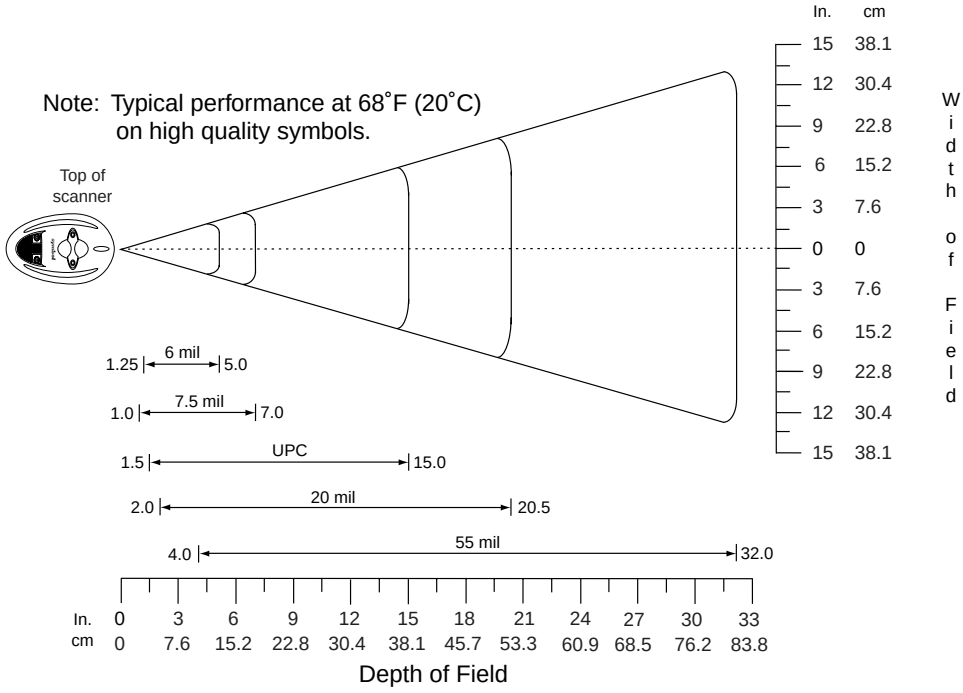



**Figure D-3. P 300PRO 1-D Decode Zone**

# P 300PRO 2-D Decode Zone

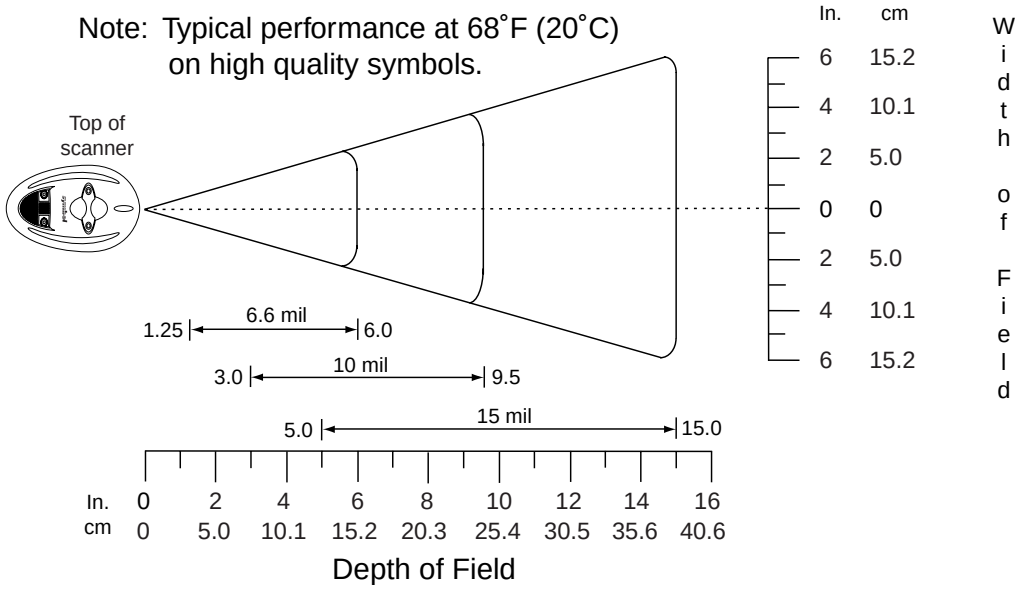
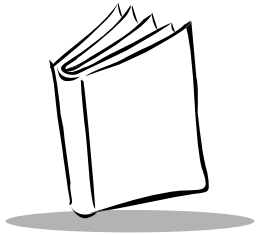



**Figure D-4. P 300PRO 2-D Decode Zone**

# Pin-outs

**Table D-2. Pin-outs**

| Pin | P 300 |
|---|---|
| 1 | Reserved |
| 2 | Power |
| 3 | Ground |
| 4 | Synapse Data |
| 5 | Synapse Clock |
| 6 | RxD |
| 7 | TxD |
| 8 | DTR |
| 9 | CTS |
| 10 | RTS |



# *Glossary*

| | |
|---|---|
| **APERTURE** | The opening in an optical system defined by a lens or baffle that establishes the field of view. |
| **ASCII** | American Standard Code for Information Interchange. A 7 bit-plus-parity code representing 128 letters, numerals, punctuation marks, and control characters. It is a standard data transmission code in the U.S. |
| **ASYMMETRIC WIDTH GROWTH** | Non-uniform growth of elements in a printed symbol. |
| **AUTODISCRIMINATION** | The ability of an interface controller to determine the code type of a scanned bar code. After this determination is made, the information content can be decoded. |
| **AVERAGE BAR WIDTH GROWTH** | Average deviation of bars from nominal widths over the entire symbol. |
| **BAD CHECK DIGIT** | Error message resulting from failure of the check digit to calculate properly. |
| **BAD DATA CHARACTER** | Error message caused by failure of one or more data characters to decode properly. |
| **BAD PRINT CONTRAST** | Error message due to lack of contrast between the background and the bars of the symbol. |
| **BAR** | The dark element in a printed bar code symbol. |

| | |
|---|---|
| **BAR CODE DENSITY** | The number of characters represented per unit of measurement (e.g., characters per inch in one-dimensional symbologies, characters per square inch in PDF417). |
| **BAR HEIGHT** | The dimension of a bar measured perpendicular to the bar width. |
| **BAR WIDTH** | Thickness of a bar measured from the edge closest to the symbol start character to the trailing edge of the same bar. |
| **BAR WIDTH DEVIATION** | Increase or decrease in bar width as compared with nominal bar width. |
| **BAUD RATE** | A measure of the data flow or number of signaling events occurring per second. When one bit is the standard "event," this is a measure of bits per second (bps). For example, a baud rate of 50 means transmission of 50 bits of data per second. |
| **BIDIRECTIONAL READING CAPABILITY** | The ability to decode a symbol successfully by reading in complementary (opposite) directions across bars and spaces. |
| **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." |
| **BUFFER** | An area of memory allocated for data storage. In this context, a buffer's data storage capacity is needed when data can flow into the device more quickly than the device can process that data. Buffering the data preserves it until it can be processed. |
| **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. |
| **CHARACTER** | A pattern of bars and spaces which either directly represents data or indicates a control function, such as a number, letter, punctuation mark, or communications control contained in a message. |

**CHARACTER SET** — Those characters available for encodation in a particular bar code symbology.

**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 and Code 128 but are optional for other symbologies. Using check digits decreases the chance of substitution errors when a symbol is decoded.

**CLUSTER** — One of three subsets of mututally exclusive codeword definitions within PDF417.

**CODABAR** — A discrete self-checking code with a character set consisting of start/stop characters (A B C D or * T N E), digits 0 to 9, and these additional characters: ( - $ : / , +).

**CODE** — Set of unambiguous rules specifying the way in which data may be represented.

**CODEWORD** — In PDF417, a single group of bars and spaces (4 bars and 4 spaces, for a total of 17 module widths) which represents one or more numbers, letters, or other symbols.

**CODEWORD PD (CODEWORD PERCENT DECODE)** — Within a PDF417 symbol, the percentage of codewords which decoded successfully; the number of good codewords divided by the total number of codewords (data codewords plus error correction codewords).

**CODE LENGTH** — Number of data characters in a bar code between the start and stop characters, not including those characters.

**CODE 128** — A high density symbology which allows the interface 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.

**CONTINUOUS CODE** — 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.

**COUNTRY FLAG** — In EAN-8 and EAN-13 codes, two or three digits which appear immediately following the left guard bar pattern.

**DEAD ZONE** — An area within a scanner's field of view, in which specular reflection may prevent a successful decode.

**DECODE** — To recognize a bar code symbology (e.g., UPC/EAN) and then analyze the content of the specific bar code scanned. To translate the bar/space pattern into defined characters within a defined symbology.

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

**DEPTH OF FIELD** — The range between minimum and maximum distances at which a scanner can read a symbol with a certain minimum element width.

**DISCRETE CODE** — A bar code or symbol in which the spaces between characters (intercharacter gaps) are not part of the code (e.g., Code 39).

**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. Main variants are EAN-8 and EAN-13.

**EDGE ROUGHNESS** — Edge irregularities as compared with a nominal bar edge.

**ELEMENT** — Generic term for a bar or space.

| | |
|---|---|
| **ENCODED AREA** | Total linear dimension occupied by all characters of a code pattern, including start/stop characters and data. |
| **ERROR CORRECTION** | In addition to error detection, the recovery capability of PDF417 over missing, destroyed, or misdecoded codewords. Error correction capability is based on the level of security (0 - 8) selected when the PDF417 label is printed. |
| **EXTRANEOUS INK** | Ink in a scan area not intended to be there (i.e., tracking and splatter). |
| **FIRST READ RATE** | Percentage of correct readings obtainable by one pass of a scanning device over a bar code. |
| **FLASH** | Derived from EEPROM, this is a type of memory that holds its content without power but must be erased in bulk — or in a "flash." Typically, these memory chips are less expensive and provide higher bit densities. |
| **GUARD BARS** | The start, stop, and center delimiting bars of UPC and EAN symbols. |
| **HOST COMPUTER** | A computer that serves other terminals in a network, providing such services as computation, database access, supervisory programs, and network control. |
| **INTERCHARACTER GAP** | The space between two adjacent bar code characters in a discrete 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 SPOT SIZE** | The diameter of the spot of laser light scanning the bar code, as measured at a given distance from the bar code. Smaller spot sizes yield higher resolution but poorer depth of focus. |
| **LED INDICATOR** | A semiconductor diode (LED - Light Emitting Diode) used as an indicator, often in digital displays. The semiconductor uses applied voltage to produce light of a certain frequency determined by the semiconductor's particular chemical composition. |
| **MIL** | 1 mil = 1 thousandth of an inch. |
| **MINIMUM REFLECTANCE DIFFERENCE (MRD)** | The difference in percentage between light reflected from spaces ($R_S$) and light reflected from bars ($R_B$). **MRD = %$R_S$ - %$R_B$.** |
| **MISREAD (Misdecode)** | A condition which occurs when the data output of a reader or interface controller does not agree with the data encoded within a bar code symbol. |
| **MODULE** | The narrowest bar or space (unit of measure) in a code. The term is used by the Uniform Code Council in its description of UPC/EAN code; it is also used in the description of Code 128. Contiguous modules are used to form bars or spaces which are wider than one unit. |
| **MODULE ASPECT RATIO** | The ratio of height to width of the narrowest bar or space, or unit of measure, in a bar code. |
| **NANOMETRE** | A unit of measure used to define the wavelength of light. Equal to $10^{-9}$ metre. |
| **NOMINAL** | The exact (or ideal) intended value for a specified parameter. Tolerances are specified as positive and negative deviations from this value. |

**NOMINAL SIZE** Standard size for a bar code symbol. Most UPC/EAN codes can be used over a range of magnifications (e.g., from 0.80 to 2.00 of nominal).

**NUMBER SYSTEM CHARACTER** In the UPC/EAN code used in a retail application, the mandatory, first encoded character, after the left guard bars. The corresponding human readable character identifies the coded character and appears at the bottom left-hand margin of the symbol. The assigned system number corresponds to a usage category for the bar coded item.

**ONE-DIMENSIONAL SYMBOLOGY** Symbologies which encode data only in a linear or horizontal dimension (X-dimension); the symbol's vertical height (Y-dimension) is redundant (e.g., UPC/EAN, Code 39).

**OPACITY** The capacity for material to interfere with transmission of light.

**OVERHEAD** The number of characters required for start, stop, and checking for a given symbol (in PDF417, also left and right row indicators and error correction codewords). For example, a one-dimensional symbol requiring start/stop and two check characters contains four characters of overhead. Thus, to encode three data characters, seven characters are required.

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

**PARITY TYPE** A parity check bit is the most significant bit of each ASCII coded character. The parity should be set to help detect transmission errors. The parity should be set to match that of the receiving device. If even parity is selected, the parity bit has a value (0 or 1) to ensure that an even number of 1 bits are contained in the coded character. If odd parity is selected, the parity bit will have a value (0 or 1) to ensure that an odd number of 1 bits are contained in the coded character. If 0 parity is selected, the parity bit always will be set to 0. If 1 parity is selected, the parity bit always will be set to 1.

| | |
|---|---|
| **PDF417** | A two-dimensional, or stacked, bar code symbology which can encode over one kilobyte of data per label and which represents data in the form of codewords (values 0 - 928). Each codeword consists of four bars and four spaces, for a total of 17 module widths; modules vary in width from one to six element widths. The symbology permits encoding up to 30 data columns and from 3 to 90 data rows. For ease of reading while still maintaining high data density, codewords are encoded in three mutually-exclusive encodation sets, or clusters, with the same cluster repeating sequentially each third row. |
| **PERCENT DECODE** | The average probability that a single scan of a bar code would result in a successful decode. In a well-designed bar code scanning system, that probability should approach near 100%. |
| **PRINT CONTRAST SIGNAL (PCS)** | Measurement of the contrast (brightness difference) between the bars and spaces of a symbol. A minimum PCS value is needed for a bar code symbol to be scannable. PCS = (RL - RD) / RL, where RL is the reflectance factor of the background and RD the reflectance factor of the dark bars. |
| **PROM** | Acronym for Programmable Read Only Memory. An integrated circuit which can be programmed through special processes and accessed at random during normal operation. Reprogramming is possible, but only through processes such as ultraviolet light erasing and electrical rewriting of data. |
| **PROTOCOL** | For a specific signaling type, a set of recognized rules governing the format and timing of message exchange. Between data communications devices, this includes an exchange of predetermined signals arranged for both establishing connection and for disconnecting. |
| **QUIET ZONE** | A clear space, containing no dark marks, which precedes the start character of a bar code symbol and follows the stop character. |
| **REFLECTANCE** | Amount of light returned from an illuminated surface. |

| | |
|---|---|
| **RESOLUTION** | The narrowest element dimension which can be distinguished by a particular reading device or printed with a particular device or method. |
| **ROW INDICATORS** | To help synchronize a PDF417 symbol's structure, codewords which collectively indicate which row a particular one is, which is the left and right side of that row, how many rows are in the symbol, what security level is encoded in the symbol, and how many data columns are in the rows. Left Row Indicators occur in each row immediately after the Start pattern; Right Row Indicators occur in each row immediately before the Stop pattern. |
| **SCAN** | Search for a symbol to be optically recognized. |
| **SCAN AREA** | Area intended to contain a symbol. |
| **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:**<br>**1. Light source (laser or photoelectric cell) - illuminates a bar code.**<br>**2. Photodetector - registers the difference in reflected light (more light reflected from spaces).**<br>**3. Signal conditioning circuit - transforms optical detector output into a digitized bar pattern.** |
| **SELF-CHECKING CODE** | A symbology that uses a checking algorithm to detect encoding errors within the characters of a bar code symbol. |
| **SHOW-THROUGH** | The generally undesirable property of a substrate that permits underlying markings to be seen. |
| **SPACE** | The lighter element of a bar code formed by the background between bars. |
| **SPECULAR REFLECTION** | The mirror-like reflection of light from a surface, which can "blind" a scanner. |
| **SPOT SIZE** | Size of the scanning aperture. |
| **SPOTS** | The presence of ink in a bar code's spaces or clear areas. These generally reduce the percent decode. |

| | |
|---|---|
| **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 the first and last encoded characters of a bar code. |
| **SUBSTRATE** | A foundation material on which a substance or image is placed. |
| **SUBSTRATE SCATTERING** | Optical phenomenon which causes bars to appear larger and spaces narrower than they are actually printed. It is caused by the scattering of incident light rays within the medium. |
| **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. |
| **SYMBOL ASPECT RATIO** | The ratio of symbol height to symbol width. |
| **SYMBOL HEIGHT** | The distance between the outside edges of the quiet zones of the first row and the last row. |
| **SYMBOL LENGTH** | Length of symbol measured from the beginning of the quiet zone (margin) adjacent to the start character to the end of the quiet zone (margin) adjacent to a stop character. |
| **SYMBOLOGY** | The structural rules and conventions for representing data within a particular bar code type (e.g. UPC/EAN, Code 39). |
| **SYMMETRIC BAR WIDTH GROWTH** | Uniform growth of bars evenly distributed. |
| **TOLERANCE** | Allowable deviation from the nominal bar or space width. |
| **TWO-DIMENSIONAL SYMBOLOGY** | Designed for high information density and higher encoding capability than one-dimensional bar codes, a symbology which encodes data in both the horizontal (X-dimension) and vertical dimensions, usually in a “stacked” or multi-row arrangement. |
| **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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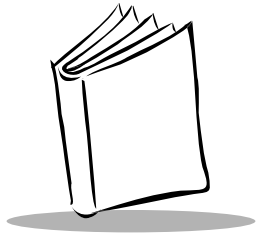
|---|---|
| **VISIBLE LASER DIODE (VLD)** | A solid state device which produces visible laser light. Laser light emitted from the diode has a wavelength of 670 to 680 nanometers. |
| **VOID** | Absence of ink within printed bars. |
| **X-DIMENSION** | Width of the narrowest element (bar of space) in a bar code symbol. |
| **Y-DIMENSION** | Element height, as applied to a two-dimensional symbology, which must equal or exceed a required minimum. |
| **ZERO-SUPPRESSED CODE** | A version of UPC/EAN which reduces the number of characters in the code. The resulting code combines the manufacturer's code and the product's code of Version A in a retail application. |



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How familiar were you with this product before using this manual?

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What topics need to be added to the index, if applicable? _____
_____

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_____

What can we do to further improve our manuals?_____
_____
_____

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