



# **Intelligent Mail® Barcode Technical Resource Guide**

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United States Postal Service

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## **Disclaimer**

The information in this document is intended to give mailers and service providers cursory information on the use of Intelligent Mail® barcode for OneCode Confirm™ and OneCode ACS™ services.

U.S. Postal Service reserves the right to change the information conveyed in this document without prior notice.

Information in this document is derived from official US Postal Service publications, including the Domestic Mail Manual. Where there is conflict, the official publications have precedence over this document.

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## 1. INTELLIGENT MAIL® BARCODE BASICS

### 1.1. Specification and Construct Summary

The Intelligent Mail® barcode is a height-modulated barcode that encodes up to 31-digits of mailpiece data into 65 vertical bars using 4-state symbology (ascender, descender, tracker and full bar).



Key specification tolerances:

- Overall barcode length between 2.667 and 3.225 inches.
- Overall barcode height between 0.125 and 0.165 inch.
- Vertical barcode clearance at least 0.028 inch; horizontal barcode clearance at least 0.125 inch.

Other physical characteristics are same as POSTNET™ and PLANET Code® barcodes. [Appendix A](#) contains the Intelligent Mail barcode specification tolerances.

The Intelligent Mail barcode consists of a 20-digit Tracking Code (Barcode ID, Service Type ID, Mailer Identifier (MID), and Serial Number) and up to 11-digit Routing Code (Destination ZIP Code). Depending on mail volume and services selected, the Intelligent Mail barcode construct will change as seen in the figures below.

**FIGURE 1: Large mailer with 6-digit Mailer ID**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Barcode ID [2N]		Service Type ID [3N]			Mailer ID [6N]						Serial Number [9N]						Routing ZIP Code [none,5,9, or 11N]													

**FIGURE 2: Small mailer with 9-digit Mailer ID**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Barcode ID [2N]		Service Type ID [3N]			Mailer ID [9N]						Serial Number [6N]						Routing ZIP Code [none, 5, 9 or 11N]													

The following fields are embedded within the Intelligent Mail barcode:

- **Barcode ID** identifies the presort makeup in conjunction with an Optional Endorsement Line.
- **Service Type ID** identifies special services requested (OneCode Confirm™ and/or OneCode ACS™) or Mail Class when used for automation rate discount without any services.
- **Mailer ID** is a 6-digit or 9-digit number that uniquely identifies the mail owner or mailing agent.
- **Serial Number** can uniquely identify the mailpiece or mailing.
- **Routing ZIP Code** must contain Delivery Point Code in order to obtain automation rate discount.

## **1.2. Producing the Intelligent Mail Barcode**

The general steps below can be followed to produce an Intelligent Mail barcode:

- Obtain application materials and Mailer Identifier (MID) from local Mailpiece Design Analyst (MDA).
- Decide on what data will go into the Intelligent Mail barcode and populate the barcode fields: Tracking Code (Barcode ID, Service Type ID, Mailer ID, Serial Number) and Routing Code (Delivery ZIP Code).
- Encode required 20-digit Tracking Code and up to 11-digit Routing Code into 65-character string (encoders available on RIBBS).
- Apply font to 65-character string (fonts available on RIBBS).
- Print barcode on mailpiece or save barcode image for later application.

The Rapid Information Bulletin Board System (RIBBS) website at <http://ribbs.usps.gov/OneCodeSolution/> contains a wide array of resources in support of generating the Intelligent Mail barcode.

## **1.3. Applying the Intelligent Mail Barcode**

The Intelligent Mail barcode can be applied on automation-rate First-Class Mail®, Standard Mail®, Periodicals, and Bound Printed Matter letters and flats for rate eligibility in lieu of the POSTNET barcode. When used with OneCode Confirm and OneCode ACS, the Intelligent Mail barcode can be applied on First-Class Mail, Standard Mail, and Periodicals letters and flats.

The Intelligent Mail barcode can be placed in any location where POSTNET barcodes are currently allowed; the most common placement is within the address block.

## **2. ONE CODE VISION® AND INTELLIGENT MAIL® BARCODE**

### **2.1. History of the Intelligent Mail Barcode**

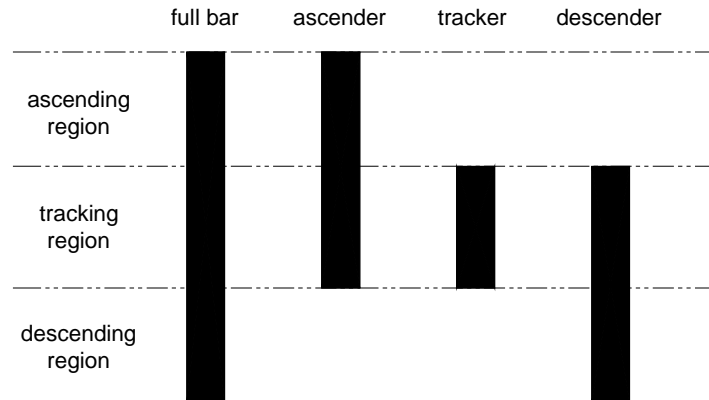
In 2003, the United States Postal Service (USPS) published the Intelligent Mail® Corporate Plan. This plan identified several key strategies including: Uniquely Identify Mail and Mail Aggregates; Develop and Deploy an Enabling Infrastructure; and Enhance Address Quality. This plan provided the following vision:

“To capitalize on the value of information about mail, the Postal Service and its customers will place an information-rich code on all mail, aggregates of mail, and business forms, enabling end-to-end visibility into the mail stream.”

In support of this OneCode Vision®, the Postal Service, in partnership with the mailing industry, developed the Intelligent Mail® barcode (formally known as the 4-state Customer Barcode). It is the next generation in the evolution of Postal Service barcode technology. It offers a more effective alternative to existing barcodes by increasing the amount of

information that is present on letter and flat mailpieces, allowing for expanded tracking capability, and creating greater visibility into the mailstream.

The Intelligent Mail barcode is a height-modulated barcode that encodes up to 31-digit string of mailpiece data into 65 vertical bars. These bars may be present in one of four possible states: full bar, ascender, tracker, and descender.



The 31-digit Intelligent Mail barcode (65 bars) is slightly longer than the 11-digit POSTNET barcode (62 bars), and it offers mailers certain flexibility in choosing the height and width of the barcode. Due to mailpiece real estate concerns and barcode print quality, some mailers expressed an interest in a shorter-height Intelligent Mail barcode. Evaluations were conducted with letter mail that allowed the Postal Service to reduce the height requirement by 16.3% for the September 2006 offering. Consequently, the read-rate and dimension analysis supported by an extensive flats test was used as a decision-making tool in determining the feasibility of a revised Intelligent Mail barcode with further reduced vertical dimensions. As a result of this, in July 2007, the Postal Service published a new Specification for the Intelligent Mail barcode with even shorter bar heights with the full bar ranging in height between 0.125 and 0.165 inches.

## 2.2. Implementation of Services and Automation Discount

The Postal Service offers a suite of services for letters and flats using the Intelligent Mail barcode. This suite of services is called the OneCode Solution™ suite. Since the initial launch of the Intelligent Mail barcode on September 1, 2006, mailers have had the option of using the Intelligent Mail barcode on letter mail for the Confirm® Service, referred to as OneCode Confirm™, and a version of Address Change Service™ (ACS™), called OneCode ACS™. The Intelligent Mail barcode can be used for automation-rate eligibility with or without these services requested. Effective May 1, 2007, the Postal Service expanded use of the Intelligent Mail barcode by allowing mailers to use IM™ barcode on automation-rate flat-size mailpieces.

The Postal Service allows mailers to use the Intelligent Mail barcode on automation-rate First-Class Mail®, Standard Mail®, Periodicals, and Bound Printed Matter letters and flats for rate eligibility in lieu of the POSTNET barcode. The Postal Service allows First-Class Mail, Standard Mail, and Periodicals letters and flats with Intelligent Mail barcode to participate in OneCode Confirm and OneCode ACS programs.

Details pertaining to the use of the Intelligent Mail barcode as part of OneCode ACS are available in *Publication 8b, Address Change Service-OneCode ACS*. Additional details about the use of the Intelligent Mail barcode as part of the OneCode Confirm are available in *Publication 197 - Confirm® Service User Guide*. These documents can be downloaded from the Rapid Information Bulletin Board System (RIBBS) website at <http://ribbs.usps.gov/OneCodeSolution/>.

At the present time, use of the Intelligent Mail barcode is optional; however, many customers have found that, because it offers significant advantages over POSTNET and PLANET Code barcodes (including using less mailpiece “real estate” and offering more overall data capacity), it makes good business sense to use this new format.

The Postal Service will require the Intelligent Mail barcode to qualify for automation discounts in May 2010. Until then, the Postal Service will continue to support the use of the POSTNET barcode for encoding the delivery point barcode for automation discount eligibility, the PLANET Code barcode for encoding tracking information for Confirm, and alphanumeric characters for conveying participant code and Keyline information for ACS.

### 3. INTELLIGENT MAIL BARCODE CONSTRUCT

The Intelligent Mail barcode carries a data payload of up to 31 digits comprised of the following elements.

Type	Field	Field Length (in digits)
Tracking Code	Barcode Identifier	2 (2nd digit must be 0-4)
	Service Type Identifier	3
	Mailer Identifier	6 or 9
	Serial Number	9 (when used with 6 digit Mailer ID) 6 (when used with 9 digit Mailer ID)
Routing Code	Delivery Point ZIP Code™	0, 5, 9, or 11
<b>Total Data Payload</b>		<b>31 (maximum)</b>

#### 3.1. Barcode Identifier

The Barcode Identifier field is a 2-digit field that is reserved to encode the presort identification that is currently printed in human readable form on the optional endorsement line (OEL) as well as for future Postal Service use. Generally, this field should be left as “00” if an OEL is not printed on the mailpiece. The exception is for automation-rate eligible flat mail with an optional endorsement line, where the Intelligent Mail barcode must contain OEL coding corresponding to the correct sortation level of each piece. Table B1 in [Appendix B](#) provides the OEL codes for use within the Intelligent Mail barcode.

### **3.2. Service Type Identifier**

The Service Type Identifier field is a 3-digit field that indicates participation, or the lack of, in various Postal Service programs. Each 3-digit value corresponds to a particular mail class with a particular combination of service(s). Eventually the Postal Service anticipates supporting many combinations of class and service using this field; however, initially only a limited set of offerings are available. Table B2 in [Appendix B](#) provides service codes and corresponding service descriptions.

Beyond simply identifying when a mailpiece carries services, the Intelligent Mail barcode will identify the mail class – even when no additional service is requested. Mailers printing the Intelligent Mail barcode solely to qualify for automation discount must populate the Service Type ID field with one of the following values: 700 for First-Class Mail, 702 for Standard Mail, 704 for Periodicals, or 706 for Bound Printed Matter. Remittance mail, such as Courtesy Reply Mail (CRM) and Meter Reply Mail (MRM), may use the Intelligent Mail barcode by populating the Service Type ID field with the First-Class Mail designation. Mailers using Business Reply Mail (BRM) without any services should populate the Service Type ID field with 708. If a mailer cannot use one of the defined mail class designations, they should call the National Customer Service Center (NCSC) Help Desk at (877) 640-0724 to request an exception.

### **3.3. Mailer Identifier**

The Mailer Identifier (Mailer ID or MID) field is a 6-digit or 9-digit number that identifies a specific agent in the mail preparation process who has responsibility for the ownership, content, make up, or preparation of the mail.

Mailpiece Design Analysts (MDAs) are responsible for issuing Mailer IDs to any customer who does not plan to subscribe to OneCode Confirm or OneCode ACS. These customers, without a previously-assigned Mailer ID, should use the MDA lookup tool at [http://pe.usps.gov/mpdesign/mpdfr\\_mda\\_intro.asp](http://pe.usps.gov/mpdesign/mpdfr_mda_intro.asp) to locate the MDA responsible for mailer's ZIP Code area.

Mail owners and mail preparers will be granted 6-digit or 9-digit Mailer IDs based upon their mail volume and criteria identified by the MDA. All 6-digit Mailer IDs will begin with '0' through '8'; all 9-digit Mailer IDs will begin with '9'.

Current Destination Confirm subscribers can generally append a leading zero (0) to their previously-assigned 5-digit Subscriber ID to populate the Mailer ID field and contact the Help Desk for Confirm service to ensure their account is configured for the Intelligent Mail barcode. OneCode ACS subscribers will be assigned 6-digit Mailer IDs in place of their previously-assigned ACS 7-character participant code (which is used to uniquely identify the mailer for each particular mail class).

### **3.4. Serial Number**

The Serial Number is a 6-digit or 9-digit field depending on the length of the Mailer ID. The Serial Number can be populated with a number that uniquely identifies each mailpiece,

becoming a Unique *Mailpiece* ID. Alternatively, the Serial Number may also be populated with a number that is unique to a mailing, becoming a Unique *Mailing* ID. The uniqueness method is left up to the mailer and can be achieved, among other things, by serializing the mailpieces, embedding Julian date, embedding mailing event, using recipient identifier, using database or mailing record ID. Serial Number uniqueness is not required when qualifying for basic automation prices.

For existing Destination Confirm users, this field can hold the PLANET Code barcode Mailing ID field, padded with additional digits to fill the field completely. For existing Origin Confirm users, the Serial Number and the Mailer ID fields can be combined into a 15-digit field to hold the PLANET Code barcode 9-digit or 11-digit Customer ID, padded with additional digits to fill the field completely. OneCode ACS users should use the Serial Number field to encode information previously encoded within the Keyline field.

### **3.5. Routing Code**

The Routing ZIP Code™ field is used to encode the destination ZIP code of the mailpiece. This field may contain a 5-digit ZIP Code, a 9-digit ZIP+4 code, or an 11-digit delivery point code. When used on letters for automation-rate eligibility purposes, the routing code must contain a delivery point code that accurately matches the delivery address. When used on flat-size pieces for automation-rate eligibility purposes, the barcode must contain either a ZIP+4 or a delivery point routing code that accurately matches the delivery address. Unlike POSTNET barcode, the Routing ZIP Code within the Intelligent Mail barcode does not require a check digit. Also, unlike POSTNET barcode, the Intelligent Mail barcode is always 65 bars regardless of ZIP Code length. In certain situations the mailer may opt not to provide a Routing Code; however, mailers should adhere to USPS program-specific guidance. The ZIP Code must never be padded with zeros, spaces or nulls that are not part of the valid ZIP Code.

Remittance or reply mail may use the Intelligent Mail barcode with a proper Routing ZIP Code for the mailpiece. Note that 11-digit delivery point codes are not permitted on Business Reply Mail (BRM). When used by Origin Confirm users, the Routing ZIP Code serves as the “Subscriber ID”, in which case the Routing ZIP Code used must be registered within the subscriber’s OneCode Confirm account.

When using OneCode Confirm for “seeding” within an automation discount mailing, a non-seeded mailpiece may use the Intelligent Mail barcode with a proper Routing ZIP Code to meet the automation discount criteria. Such an Intelligent Mail barcode should use one of the Service Type IDs defined for use as a Mail Class Designator (those codes without services) to indicate that the piece is not intended to generate Confirm information. The Mailer Identifier field should contain the appropriate Confirm Subscriber ID.

## 4. BARCODE PRODUCTION CHARACTERISTICS

### 4.1. Creating the Intelligent Mail Barcode

Encoding data into a POSTNET or PLANET Code is very straightforward: each digit in the payload is represented by a predefined pattern of 5 bars. Encoding data into an Intelligent Mail barcode is more complex. The encoding algorithm that translates the 31 digits in the payload into 65 bars is defined in the USPS publication, *Specification USPS-B-3200*, which is available for download from the Rapid Information Bulletin Board System (RIBBS) website at <http://ribbs.usps.gov/OneCodeSolution/>.

To facilitate the adoption of the Intelligent Mail barcode, the Postal Service has developed, and is making available at no charge, a web-based, interactive encoder-decoder tool, and an extensive library of encoding software and fonts suitable for encoding and printing the Intelligent Mail barcode in mail production environments using selected operating systems and printing architectures. These resources are available from the same RIBBS web site.

To download the library of encoding software and fonts from the RIBBS website, users must first request a user ID and password by calling the NCSC Help Desk at (877) 640-0724 or contacting them via <https://ribbs.usps.gov/onecodesolution/contact.html>

Once logged in, users will be able to download the encoding software package for any particular operating system of interest. Each package contains all the files needed to use the encoder software under that operating system in any of the languages or applications that are supported. The Postal Service currently provides software, implemented in C, Java, Cobol, and PL1. The supported operating systems are: MVS, z/OS, OS/390, VSE/ESA, OS/400, AIX, Linux, and Windows. The list of combinations available is provided in [Appendix C](#).

For each operating system, the encoding software package is distributed as a standard ZIP file. Users can use any utility that can handle a PKZIP file to extract the individual files to the path stored on the ZIP File. A user guide is included in each package to provide detailed operating system and language-specific instructions on how to install and use the files in the package. All the required binary loadable software modules and a number of source files for installation verification are also included in the package.

Independent of operating system and language, the encoding software works as follows. Each call to the encoder requires two arguments: a 20-digit tracking code, and none, 5, 9, or 11-digit routing code. The encoder will return the status of the encoding function along with a 65-character string of the letters F, A, D, or T, representing a full bar, ascender, descender, or tracker, respectively.

For example, a tracking code of 00040123456200800001 and a routing code of 987654321 will be encoded into the following 65-character string:  
ADTTTATTTFTDFADTDTFTAATATADDDDFTTDTDFDFTTATAFFDDADDTFFADDFDFTTTAD  
When the string is printed with the Intelligent Mail barcode font, the actual barcode will be produced:



From the RIBBS website, registered and logged in users will be able to download the font package needed to install and use the font for the following major production printing environments: Advanced Function Printing (AFP), XEROX Metacode, Hewlett Packard's PCL (Print Control Language), Adobe's Postscript, and TrueType.

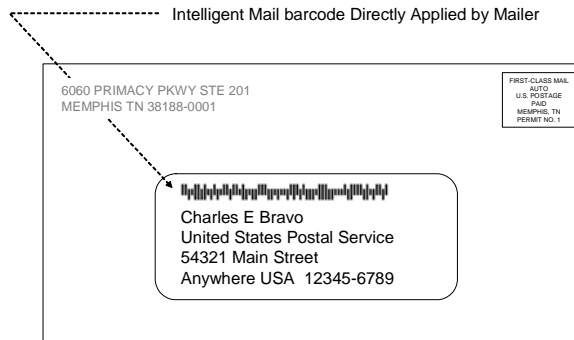
## 4.2. Placement of the Intelligent Mail Barcode

On letters, the Intelligent Mail barcode can be placed in the address block or in the barcode clear zone. On flats, the Intelligent Mail barcode can be placed anywhere on the address side as long as it is at least 1/8 inch from any edge of the piece. To avoid ambiguity, only one Intelligent Mail barcode can be placed in the same area.

The placement configurations of the Intelligent Mail barcode on a letter-size and flat-size mail are defined in the *Domestic Mail Manual (DMM™)*. Below are some commonly used placement configurations. The mailpiece images used to illustrate these configurations are not meant to be exact or exhaustive; note that the POSTNET barcode is acceptable for automaton prices only until May 2010. For additional details concerning barcode placement, please refer to 202.5, 302.4 and 503.13.3 of the *DMM*.

### Configuration 1

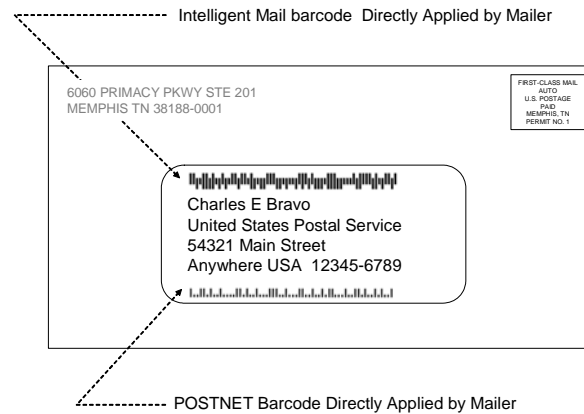
- Mailer applies the Intelligent Mail barcode above or below the address within the address block.
- Mailer encodes the delivery point code in the Intelligent Mail barcode along with the tracking code.



**Configuration 1 (with Intelligent Mail barcode above address)**

### Configuration 2(a)

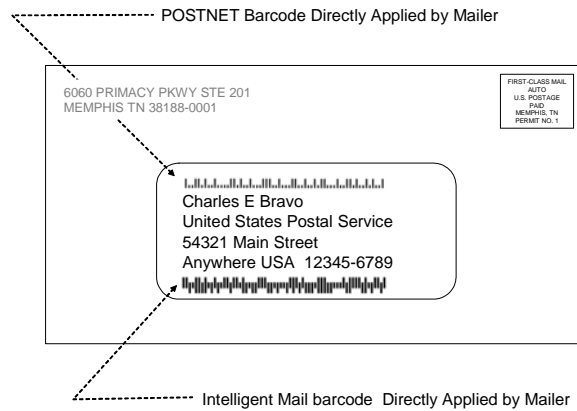
- Mailer applies the Intelligent Mail barcode above the address within the address block.
- Mailer encodes the delivery point code in a POSTNET barcode below the address in the address block.



**Configuration 2(a)**

### Configuration 2(b)

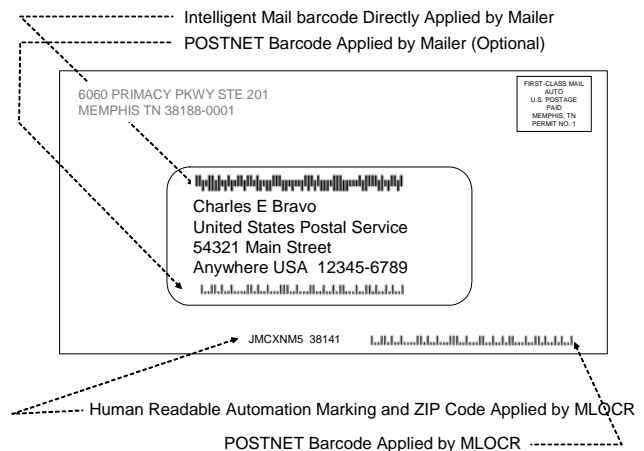
- Mailer applies the Intelligent Mail barcode below the address within the address block.
- Mailer encodes the delivery point code in a POSTNET barcode above the address in the address block.



**Configuration 2(b)**

### Configuration 3

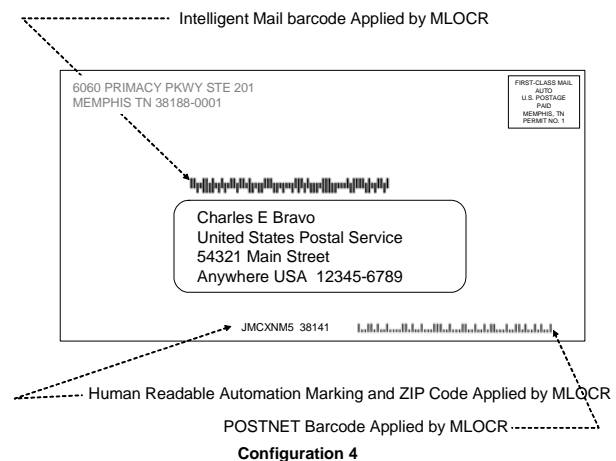
- Mailer applies the Intelligent Mail barcode with or without POSTNET barcode within the address block as in Configuration 1, 2(a), or 2(b).
- MLOCR applies POSTNET barcode in the barcode clear zone, along with the human readable automation marking<sup>1</sup> and ZIP Code to the left.



**Configuration 3**

### Configuration 4

- Mailer does not apply POSTNET barcode or the Intelligent Mail barcode directly in the address block.
- MLOCR applies the POSTNET barcode in the barcode clear zone, along with the human readable automation marking and ZIP Code to the left.
- In addition, MLOCR applies the Intelligent Mail barcode containing the tracking code above the address block.

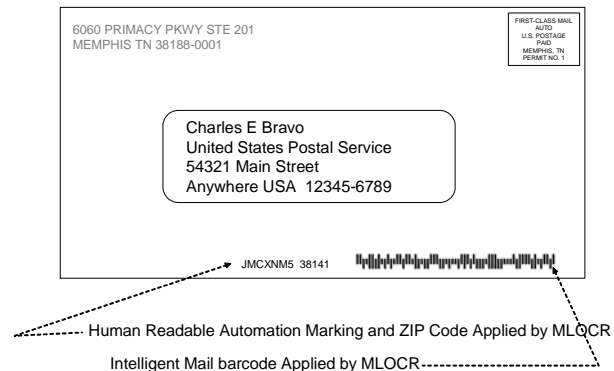


**Configuration 4**

<sup>1</sup> It is also known as automation rate marking. Requirement for automation marking is stated in 604.9.4.14(e) of the DMM. Specification for automation marking is in 705.5.3.2 of the DMM.

### Configuration 5

- Mailer does not apply POSTNET barcode or the Intelligent Mail barcode directly in the address block.
- MLOCR applies the Intelligent Mail barcode containing the routing code and tracking code in the barcode clear zone, along with the human readable automation marking and ZIP Code to the left.



**Configuration 5**

On letters, the Routing Code from a barcode (Intelligent Mail barcode or POSTNET barcode) in the lower right clear zone takes precedence over that in the address block.

## **5. ADDITIONAL RESOURCES**

The Domestic Mail Manual (DMM) can be found at [http://pe.usps.com/text/dmm300/dmm300\\_landing.htm](http://pe.usps.com/text/dmm300/dmm300_landing.htm). It contains, among other things, all official rates and standards governing domestic mailing services, including physical standards and barcode placement.

For general information, or to download specifications, publications for various services, and the library of encoding software and fonts, please visit the RIBBS web site at: <http://ribbs.usps.gov/OneCodeSolution/>.

To obtain User ID and Password to download the library of encoding software and fonts, or for technical assistance in using the online tool or the library of encoding software and fonts, contact the NCSC Help Desk at (877) 640-0724.

The Help Desk for Confirm service can be reached at (800) 238-3150.

The Help Desk for ACS can be reached at (877) 640-0724.

The Mailpiece Design Analyst Lookup Tool for non Confirm or ACS IM™ barcode usage is located at [http://pe.usps.gov/mpdesign/mpdfr\\_mda\\_intro.asp](http://pe.usps.gov/mpdesign/mpdfr_mda_intro.asp)

The Help Desk for *PostalOne!* can be reached at (800) 522-9085.

## Appendix A. Intelligent Mail barcode physical characteristics

Table A1 – Intelligent Mail Barcode Dimensions

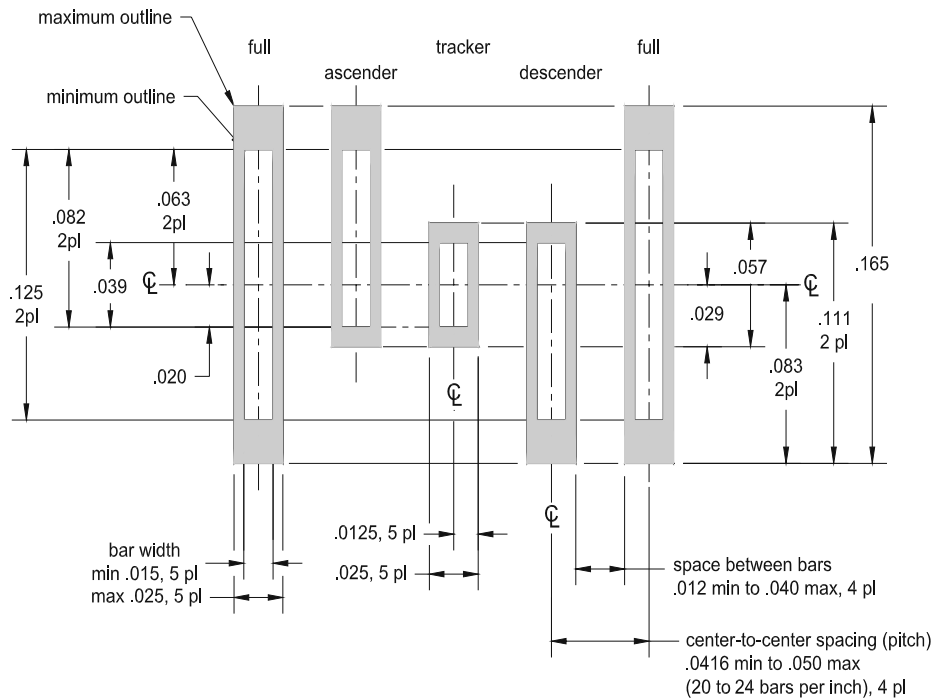


Table A2 – Comparison of Existing Postal Barcodes

Attribute	11-digit POSTNET Barcode	13-digit PLANET Code Barcode	31-digit Intelligent Mail Barcode
Number of bars	62	72	65
Bar Width	0.020 ± 0.005 inch	0.020 ± 0.005 inch	0.020 ± 0.005 inch
Horizontal Pitch	22 ± 2 bars per inch	22 ± 2 bars per inch	22 ± 2 bars per inch
Height of Full Bar	0.125 ± 0.010 inch	0.125 ± 0.010 inch	0.145 ± 0.020 inch *

\*NOTE: Barcode height is based on Specification USPS-B-3200 Revision E. Earlier Specification USPS-B-3200 Revision C stipulated Intelligent Mail barcode Full Bar height at 0.182 ± 0.048 inch.

**Appendix B. Intelligent Mail barcode field values**

Table B1 – Barcode Identifier

Value	Optional Endorsement Line (OEL) Description
00	Default / No OEL Information
10	Carrier Route (CR), Enhanced Carrier Route (ECR), and FIRM
20	5-Digit/Scheme
30	3-Digit/Scheme
40	Area Distribution Center (ADC)
50	Mixed Area Distribution Center (MADC), Origin Mixed ADC (OMX)

Table B2 – Service Type Identifier

Value	Mail Class/Service Description
700	First-Class Mail with no services
702	Standard Mail with no services
704	Periodicals with no services
706	Bound Printed Matter with no services
708	Business Reply Mail with no services
040	First-Class Mail with Destination Confirm
042	Standard Mail with Destination Confirm
044	Periodicals with Destination Confirm
050	Origin Confirm
052	Business Reply Mail Origin Confirm
080	First-Class Mail with Address Service Requested
082	First-Class Mail with Change Service Requested
090	Standard Mail with Address Service Requested
092	Standard Mail with Change Service Requested

782	Periodicals with Address Service Requested
422	Bound Printed Mail with Address Service Requested (currently unavailable)
431	Bound Printed Mail with Change Service Requested (currently unavailable)
140	First-Class Mail with Destination Confirm and Address Service Requested
240	First-Class Mail with Destination Confirm and Change Service Requested
142	Standard Mail with Destination Confirm and Address Service Requested
242	Standard Mail with Destination Confirm and Change Service Requested
144	Periodicals with Destination Confirm and Address Service Requested

**Appendix C. Encoding Software Packages and Fonts Available on RIBBS**

<b>Operating System</b>	<b>Language and Applications Supported</b>					
	C	Java 2	COBOL	PL/1	MS Access	MS Excel
MVS, z/OS, and OS/390	Yes	Yes	Yes	Yes		
VSE/ESA	Yes		Yes	Yes		
OS/400	Yes	Yes	Yes			
AIX	Yes	Yes				
Linux for pSeries	Yes	Yes				
Linux for Intel (including Intel-compatible systems)	Yes	Yes				
Programmer Version for Windows	Yes	Yes				
MS Office Version for Windows					Yes	Yes

<b>Fonts</b>	<b>Type</b>	
	Fixed Pitch Bitmap	Scalable
The Advanced Function Printing (AFP)	Yes	
The XEROX Metacode	Yes	
Hewlett Packard's PCL	Yes	
Adobe's Postscript	Yes	Yes
TrueType		Yes