NATIONWIDEBARCODE
www.nationwidebarcode.com

Barcodes Demystified

Phil Peretz
Nationwide Barcode

Version 3.3

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Table of Contents

Forward

The world of UPC barcodes can be daunting and confusing. The purpose of this book is to help you better understand how barcodes work.

About the author:

Phil Peretz is the President/COO and founder of Nationwide Barcode, a barcode solutions provider for individuals and companies that need a fast, legal and efficient way of getting UPC and EAN barcodes.

His professional career starting in advertising as classified advertising manager for a series of weekly newspapers. At 21, he was hired as an art director for Diablo Valley Publishing, at 25, retail operations manager and then found his passion as a sales manager and VP of sales in both the printing and high tech industries focusing on building strong and successful sales teams.

9 years of his career was with Kinko's where he started off as a corporate account manager shattering all existing sales records and went on to be promoted to Regional Sales Manager, Director of Sales and then Regional Sales VP.

Peretz then moved into the high tech sector as Director of Sales for an optical media manufacturing company and his own company, CDDVD Now. After selling off his company, Peretz moved to Reno Nevada where he and his wife, Catherine Young-Peretz, founded Media Media Inc.

In addition to running Nationwide Barcode, Peretz and Media Media Inc. works with businesses of all size to helping them develop innovative ways of communicating, marketing and building profitable sales.

Nationwide Barcode: http://www.nationwidebarcode.com
Media Media Inc.: http://www.mediamediainc.com
UPCBarcodes.com: http://www.upcbarcodes.com
Dynamic Qr Codes: http://www.mmisscan.com

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Why do I need a barcode?

You've manufactured or ordered your products and you realize that you need a barcode. Barcodes are used to convey prices to the electronic cash registers in stores and are also used to help manage inventory. You will need a barcode for each product or variation of product that you sell. If you are selling t-shirts, you will need one for each design, color and size. You either add the barcode graphic to you artwork while designing your packaging artwork or you order barcode labels and affix a label to each one of the packages. You are ready for business and you have everything you need to start selling your products to stores.

The stores place an order with you and you provide them with a product specification sheet – this is a list of your products, product details and the UPC or EAN barcode for each item. Every store maintains their own database of products and barcode numbers. There is no database that contains all products everywhere.

- There is nothing embedded in a UPC or EAN barcode except for the numbers that are beneath the barcode. When they enter the info into their database, the numbers are associated with your product. When a barcode scanner scans the barcode, it turns the bars back into numbers and looks for the item associated with it.

- There are a number of ways that you can communicate this information to the retailers, your retailer will let you know how they want the information. Sometimes they will ask for a printed sheet with a list of your items, sometimes they will want an excel spreadsheet that they can upload to their database. This all depends on the number of items and their level of technical requirements.

- The information that you have supplied gets entered into the computer that connects all of their POS systems (electronic cash registers). All of this is done at store level because there is no accurate and complete database of products, and if there was, it could potentially carry billions of items. That's too much data for local stores to access, so, all stores only concern themselves with their inventory.

- Your products are delivered to the retailer and once received into inventory and are now available for purchase.

- Sometimes your retailers will ask you to add an additional barcode to the outside carton. They will refer to this as a Shipping Container Barcode or a GTIN-14. We can provide those too.

- A customer picks up the item to be purchased and heads to the check-stand.

- The item is scanned and the point of sale system (cash register) requests information about the product from the database. Once purchased, the Point of Sales system tells the database to subtract the number of items purchased.

- The customer pays for the item and the transaction is complete.

Introduction to Barcodes

Wherever you go, the grocery store, department store, on line at Amazon or your own refrigerator or pantry, you'll find that everything that you purchase has a UPC barcode on it. Sometimes they are a little hard to find, but if you flip the package around, it's there.

In this book, we will demystify UPC and EAN barcodes so that you have a better understanding of how they work.

A barcode is an optical machine-readable representation of data. One of the first uses of barcodes was to label railroad cars, but they were not commercially successful until they were used to automate supermarket checkout systems, a task in which they have become almost universal.

Systems such as RFID are attempting to change the standard, but the simplicity, universality and low cost of printed barcodes has limited the role of these other systems. It costs less than one-half of one cent to implement a printed barcode compared to seven to thirty cents to implement a passive RFID.*

George Joseph Laurer developed the Universal Product Code in 1973. As an engineer at IBM he was asked to develop the pattern used for the Universal Product Code (UPC-A Barcode).

GS1, which used to be called the Uniform Code Council (UCC) is the provider of UPC barcode prefixes. A company goes to the GS1, they purchase the prefix and then are responsible for the self-assignment of the identification numbers that go after the prefix.

The Barcode prefix, the first 6, 7, 8 or 9 digits, is called a UPC Barcode Prefix The company who has been assigned the UPC Barcode Prefix is responsible for the assignment of the next digits (making up a total of eleven digits) to their products.

Then, as the barcode number is designated, the last number is mathematically determined through an algebraic equation to create a checksum (check digit). This check digit is the final digit. When you join GS1, you get a prefix certificate along with your start-up package.

As far as we know, there are only a small handful of companies that require a copy of this certificate: Kroger's, Wal-Mart/Sam's Club JC Penny's and Macy's. The common denominator of these companies is that they are using the manufacturer prefix for their EDI (Electronic Data Interchange). Since this is how they make sure their vendors get paid.

Unless you are specifically going to do business with these chains, you have the option of using a company that is legally able to subdivide their barcode prefix.

The GS1 maintains the database of Prefixes. It is our opinion that, although this database is conceptually a great idea, and has to be maintained, it is virtually ignored, unknown and unused.

Retailers input information from product data sheets filled out or given to them by their suppliers. The supplier gives the retailer the product information including the barcode based on the human readable numbers (12 digit UPC or 13 digit EAN) and the retailer enters it into their point of sale system.

There are no unified and formal centralized databases of product barcodes. Using the mathematical formula x=12x10 there are potentially 10 billion products that can be represented by UPC-A barcodes at any given time – 100 billion if you take add the extra digit on an EAN.

This, more than anything else, explains why there is no centralized database of products. No one has the bandwidth, energy or resources to catalog something this massive.

There is nothing programmed into a UPC or an EAN barcode. The bars only represent the number that is the barcode. The retailer associates these numbers with the product information. This information is pulled from the retailer's database when a product is scanned.

You have two choices when you need to buy a barcode or block of barcodes. You purchase directly from the GS1 (They charge a minimum of $750.00 plus a yearly renewal fee) or you purchase from us or a company like Nationwide Barcode (www.nationwidebarcode.com). Nationwide Barcode and similar companies received their prefixes in the 90's or early 2000's

In 2002 GS1 attempted to codify the agreement with UPC Barcode prefix holders which included renewal fees. The codified agreement included rules that were in the form of a contract which included not being able to subdivide a barcode number. Prior to this, none of this existed.

The GS1 decided to change the way they were doing business. They started sending out renewal notices insisting that the prefix holders pay renewal fees and agree to the new terms and conditions.

Ultimately a class action suit was levied against the GS1 in the state of Washington and the GS1 lost. All prefix owners prior to August 28, 2002 became exempt to the GS1's renewal fees and new codified agreement.

> ***Quoting the UCC Settlement web site:***
> *This Settlement provides that companies who became members of UCC before August 28, 2002, are not obligated to pay membership renewal fees to UCC to maintain membership as a condition for their use of Company Prefixes issued to them by UCC, or as a condition for Basic Membership Benefits as defined in the Class Settlement Agreement. Class members who have paid a renewal fee to UCC are entitled to compensation from a $3,895,000 settlement fund. The settlement also provides that the "licensing agreement," which accompanied UCC renewal fee invoices, is null and void as to those who became members in UCC before August 28, 2002. ***

Quoting George Laurer, "Often I am asked if a person that purchases a number from a subset seller will have legal problems in the future. Again, I am not a lawyer, but if the number was originally assigned to the seller by the UCC before August 2002, the answer is no problem."****

The decision to go with the GS1 or a UPC barcode reseller is a matter of economies of scale. GS1 charges an upfront fee and a yearly renewal fee based upon the number barcode numbers that you need along with your company's revenue. The more you make, the more the barcode prefix will cost you, and this amount can increase over time.

We believe that the GS1 is a great organization, they provide a tremendous service, however, for a small business with a limited budget, a Barcode Subdividing company makes the most sense.

** Text provided by Wikipedia and is available under the Creative Commons Attribution/Share-Alike License. http://en.wikipedia.org/wiki/Barcode ** http://www.ibcaweb.org/ucc-settlement.htm *** http://bellsouthpwp.net/l/a/laurergj/UPC/renufee.html (page on George Laurer's website) **** http://www.laurerupc.com (George Laurer's site)*

Are the U.P.C. and EAN-13 the same symbol?

The short answer is yes.

EAN = 0012345678905
UPC = (0)012345678905 or 012345678905

The GS1, the original source for barcodes has created the confusion between UPC (Universal Product Codes) and EAN (European Article Numbers also called International Article Numbers). The UPC-A barcode was the original format for product barcodes. As demand in Europe, Asia and Australia started growing, country codes were added. (We have a list of country codes in this book). US and Canada have a a country code of zero which is not printed under the barcode nor is it entered in US and Canadian Inventory and Point of Sale Databases.

If you look at the graphics below, you will see they are exactly the same. The width of the bars and the width of the spaces between the bars are exactly the same. The only major difference is the placement of the numbers below (human readable numbers) which are there only as a back-up in case the barcode doesn't scan properly and the information has to be manually entered into the point of sale system

We have overlaid the UPC and the EAN graphics (symbologies) so you can see that the graphic is identical. The country code doesn't appear beneath the barcode in a UPC since the GS1 didn't grasp the importance of US and Canada indicating country codes. They felt that since the majority of products sold in both countries originate from importers, distributors or manufacturers in the US or Canada, they could forego the leading zero in the human readable numbers.

We still believe that if you are currently doing business in the United States and Canada exclusively, it is safer to order UPC barcodes for your products. Many retailers, especially smaller retailers may be using older accounting and inventory systems that only allow them to enter in 12 digit UPC numbers and not a 13 digit string. If this changes in the future, you can convert your 12 digit UPC to a 13 digit EAN by adding in the country code 0. There is nothing on the horizon indicating that the US and Canada will ever switch over to EAN 13 barcodes.

This following information is used with permission from George Laurer– http://www.laurerupc.com . Mr. Laurer is the inventor of the UPC barcode.

There seems to be considerable confusion concerning the difference and use of the U.P.C. code and EAN codes

"U.P.C. Version A" and "EAN-13” are and always have been 13 character symbols and the numbers themselves have always been 13 characters long. The U.P.C. (Version A) symbol and the EAN13 symbol are essentially one and the same. They both have the same number of bars and spaces.

* I have used the name UCC throughout to avoid confusion although it evolved to this name over many years. In 1975 it was called UPCC (Uniform Product Code Council).

The origin of EAN vs. U.P.C. confusion. (by George Laurer)

When I conceived the U.P.C. for the grocers in the U.S. only 12 digits were required including the check character. I designed a symbol in which the left half of the symbol was composed of “odd” parity characters and the right side was composed of “even” parity characters. Each printed character has two bars and two spaces and is made up of 7 modules. Odd parity simply means the printed representation of the numeric digit has an odd number of dark modules. Conversely even parity printed digits have an even number of dark modules.

The UCC* chose to call the U.P.C. a 10 character symbol and they chose to print only 11 of the characters in human readable form. The 10 characters identifying the manufacturer and item were printed below the bars. The “system number” character was printed halfway up the left side. Further, they chose to carry only 10 digits of the number in their files. The reason was both political and practical.

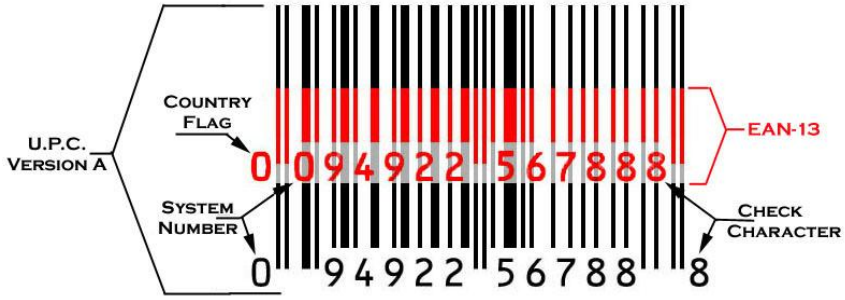
Before the symbol marking was considered a well know consulting firm had been hired by the fledgling UCC to determine the number of digits needed to accomplish the goals of the grocery industry. Considering many factors, not the least of which was the limited power of computers of the day, a figure of 10 digits was recommended. It was a tough sell to convince the many groups involved that they would have to change whatever numbering system they were using to the new 10 digit number. Rather than admit that the consulting firm was wrong and so as not to open the number of digit argument again, the decision was to maintain that the U.P.C. was a 10 digit symbol and number. Another factor considered was that it was more difficult to key the EAN human readable that the U.P.C. human readable when the symbol did not scan. They fostered the illusion by requiring that the check digit be stripped at the scanner. The SN (system number) was necessary for in store processing but it was not needed in records transferred between systems. The illusion was reinforced by not printing the SN in line with the 10 product identifying digits and not printing the check digit at all.

After the U.P.C. had been in use several years, Europe recognized the usefulness of the U.P.C. but realized a 13th digit was needed to identify the many countries. I encoded the extra digit by encoding the left half of the symbol with 3 characters of even parity and 3 characters of odd parity and then arranging them in various patterns, each pattern representing a different country code. The scanner recognizes a series of digits as the right half of a symbol if the parity of the characters is all even and it recognizes the left half if it is composed of all odd **OR** if three characters are odd parity and three characters are even parity characters.

With the acceptance of the EAN in Europe it was understood that the U.P.C. was actually 13 digits because the parity pattern of the left half of all odd characters was assigned the value (or country flag) of “0”. I pointed out that the UCC only printed 11 of the 13 digits and carried only 10 digits in the system. The UCC continued the delusion by using the foolish argument that "0" means nothing and therefore could be ignored. On the other hand, the European's were smart enough from the very outset to call the EAN symbol what it is, “EAN-13” and they printed all 13 characters. Systems in Europe carried all 10 country flags including 0 in their records and their systems could process both U.P.C. and EAN symbols and/or numbers. The U.S. groceries chains at the time were selling very few foreign goods and saw no reason to spend money modify their installed equipment. Although the U.P.C. was not widely accepted at that time, the UCC accommodated the foreign companies by issuing them U.P.C. numbers with the invisible country flag of “0”.

Although this was a burden on the European companies and was a waste of numbers since many European companies had both U.P.C. and EAN-13 numbers, it wasn't until two decades later that something was done about this. In 1997 the Uniform Code Council, Inc announced project ***SUNRISE***. This initiative required that all U.S. and Canadian companies must be capable of scanning and processing EAN-13 symbols, in addition to U.P.C. symbols, at point-of-sale by January1, 2005. This has been completed, the UCC has changed its name to GS1 US, and they have taken the responsibility of controlling both U.P.C. and EAN numbers.

Simply put the U.P.C. and EAN-13 symbols and numbers are the same. Below is a U.P.C. symbol with its equivalent EAN-13 superimposed in red. One can see that the bars and space are the same, only the human readable is different. Note that the U.P.C. has evolved in that the check digit is now printed and also that the SN has been brought down in line with the other characters but the country flag is still not printed. I would expect that in the near future the human readable will also be changed to the EAN format.



Because there are more than 9 countries, the country flags have been further subdivided by using the next two digits for various uses and countries. The United States and Canada have the country flag 0 and subdivisions 000 thru 139. It is interesting to note that the publishing industry produces so many products that it is its own country called "Bookland" for number assignment purposes. Bookland has been given two subdivisions of the country flag 9. They are 978 and 979.

--end of article by George Laurer.

Anatomy of a Barcode

UPC

EAN

The barcode symbol has two parts:

1) The machine-readable bar code (The bars)
2) The human-readable number (the numbers below)

In this picture, the manufacturer identification number is the first six digits of the UPC number – (0)753182 in the image above. The next five digits -- 95342 -- are the item number. The GS1 supplies 7, 8 and 9 digit manufacturer numbers as well. The last number, 7, is the check digit.

The person that coordinates which barcode goes with which product is called a UPC coordinator. This person is responsible for assigning item numbers to products, making sure the same code is not used on more than one product, retiring codes as products are removed from the product line, etc.

Typically, every item that a manufacturer sells, in addition to every variation of the item requires a different item code. Since the barcode is also used to track inventory, it is important to have a different barcode for each of these variations. Using shoes as an example, a man's oxford shoe may come in Black, Brown, and Cordovan, each in sizes, 9, 10, 11, 12, 13 and 14. Each of these variations (3 colors x 6 sizes = 18 different products)

0: Standard UPC number
1: Reserved
2: Random weight items (fruits, meat, vegetables, etc.
3: Pharmaceuticals
4: In store marketing for retailers (a store can set up unique barcodes for themselves, but no other store will be able to read them)
5: Coupons
6, 7,8 Standard UPC number
9: Reserved

The Check Digit

The last digit of a UPC or EAN barcode is called a check digit.

This number lets the scanner (and the computer attached to it) know if the number was scanned properly or not. It is a very important part of the barcode.

The first 11 digits of a UPC barcode or the first 12 digit of an EAN barcode are a combination of the prefix and the numbers assigned to a particular product. The final check digit is a mathematical algorithm weaving through the first 11-digits

The number at the far right is the check digit. In this case, it's a 7. If you want to compute the check digit for a UPC-A Barcode in Excel, do the following:

Positions	UPC	EAN	Multiply by	equals
N_1		0	1	0
N_2	7	7	3	21
N_3	5	5	1	5
N_4	3	3	3	9
N_5	1	1	1	1
N_6	8	8	3	24
N_7	2	2	1	2
N_8	9	9	3	27
N_9	5	5	1	5
N_{10}	3	3	3	9
N_{11}	4	4	1	4
N_{12}	2	2	3	6
			SUM	113

Subtract the sum from the nearest equal or higher multiple of 10. (90 would be 90, 92 would be 100, etc.)

In this example the next highest multiple of 10 is 120. 120-113 = 7: 7 is the check digit.

There is no hidden data built into a barcode, there is no pricing information, there is no product information. The bars represent only the 12-digit number.

The way that it works is:

- The manufacture affixes the barcode to the product.
- The retailer inputs information about the product into their back-end computer that controls and communicates to all of the store's Point of Sales systems (cash register).

- The customer brings up their purchase to the front counter, the item is scanned and the POS system communicates to the back-end system pulling the information about the product.

- The info is printed on the sales receipt, the price is charged and then, the items are deducted from the store's inventory.

Barcode Sizes

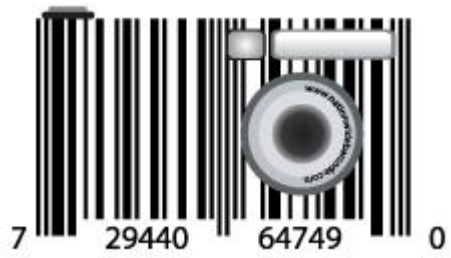
UPC barcode sizes are referred to by magnifications. The nominal size of a UPC 1.5 x 1” EAN and UPC numbers are scanned by retail omni-directional scanners. This means that UPC/EAN barcodes have a fixed relationship between symbol height and width. When one dimension is modified, the other dimension should be altered by a proportional amount.

The minimum size of a UPC should be 80%; the maximum size is 200%. If you do not have enough room, you can truncate the height of your barcode, meaning that the height is a little shorter. Many chain store retailers may apply non-compliance fines if your barcode doesn’t scan or scans incorrectly.

The barcode to the left is 1.5” x 0.8” which scans perfectly. Cropping a barcode is the optimal way of truncating it.

Barcodes also require that there is a .025” quiet zone from the left and the right of the outside bar. Without this quiet space, the barcode may not scan. The absolute requirement is that a barcode will scan. If you need to alter the size, double check that the barcode will scan.

Nationwide Barcode and sister company Media Media Inc., provides a novel approach to creating UPC and EAN barcode graphics.



Want to see some additional cool barcode art?
http://www.nationwidebarcode.com/other-services/upc-barcodes-as-art/

Country Codes

UPC Barcodes DO NOT HAVE COUNTRY CODES…and, you cannot tell the country of origin from a barcode. You can only tell where the barcode prefix originated

Barcode prefixes do not provide identification of origin for a specific product. They merely provide number capacity to different countries for assignment of barcode prefixes by the GS1.

UPC Barcodes do not show the leading zero. A UPC Barcode that starts with 7 would have a country code of 070 – 079.

Here is the current list of country codes

00 – 019 U.S. and Canada
020 – 029 Restricted distribution
030 – 039 U.S. drugs (see U.S. National Drug Code)
040 – 049 Restricted distribution (MO defined)
050 – 059 coupons
060 – 099 U.S. and Canada
100 – 139 U.S.
200 – 299 Restricted distribution
300 – 379 France and Monaco
380 Bulgaria
383 Slovenia
385 Croatia
387 Bosnia and Herzegovina
389 Montenegro
400 – 440 Germany (440 code inherited from old East Germany on reunification, 1990)
450 – 459 Japan
460 – 469 Russia
470 Kyrgyzstan
471 Taiwan
474 Estonia
475 Latvia
476 Azerbaijan
477 Lithuania
478 Uzbekistan
479 Sri Lanka
480 Philippines
481 Belarus
482 Ukraine
484 Moldova
485 Armenia
486 Georgia
487 Kazakhstan
488 Tajikistan
489 Hong Kong SAR
490 – 499 Japan
500 – 509 United Kingdom
520 – 521 Greece
528 Lebanon
529 Cyprus
530 Albania
531 Macedonia
535 Malta
539 Ireland
540 – 549 Belgium and Luxembourg
560 Portugal
569 Iceland
570 – 579 Denmark, Faroe Islands and Greenland
590 Poland
594 Romania
599 Hungary
600 – 601 South Africa
603 Ghana
604 Senegal
608 Bahrain
609 Mauritius
611 Morocco
613 Algeria
615 Nigeria
616 Kenya
618 Côte d'Ivoire
619 Tunisia
621 Syria
622 Egypt

624 Libya
625 Jordan
626 Iran
627 Kuwait
628 Saudi Arabia
629 United Arab Emirates
640 – 649 Finland
690 – 695 China, The People's Republic
700 – 709 Norway
729 Israel
730 – 739 Sweden : EAN/GS1 Sweden
740 Guatemala
741 El Salvador
742 Honduras
743 Nicaragua
744 Costa Rica
745 Panama
746 Dominican Republic
750 Mexico
754 – 755 Canada
759 Venezuela
760 – 769 Switzerland and Liechtenstein
770 – 771 Colombia
773 Uruguay
775 Peru
777 Bolivia
779 Argentina
780 Chile
784 Paraguay
785 Peru
786 Ecuador
789 – 790 Brazil
800 – 839 Italy, San Marino and Vatican City
840 – 849 Spain and Andorra
850 Cuba
858 Slovakia
859 Czech Republic
860 Serbia
865 Mongolia
867 North Korea
868 – 869 Turkey
870 – 879 Netherlands
880 South Korea
884 Cambodia
885 Thailand
888 Singapore
890 India
893 Vietnam
896 Pakistan
899 Indonesia
900 – 919 Austria
930 – 939 Australia
940 – 949 New Zealand
950 GS1 Global Office: Special applications
951 EPC global: Special applications
955 Malaysia
958 Macau
960 – 969 GS1 Global Office: GTIN-8 allocations
977 Serial publications (ISSN)
978 – 979 Bookland (ISBN) – 979 formerly used for sheet music
980 Refund receipts
981 – 983 Common Currency Coupons
990 – 999 Coupons
Prefix 950 (GS1 Global Office) is used for special applications and bi-lateral agreements.

What is a coupon code?

The coupon code starts with a 5 to indicate that it is a coupon, the next 5 numbers are positions two through six of the company prefix, the next three digits are the family code.

These are assigned by the manufacturer to group products within a family of products. A family would be shoes – all sizes or colors, Vitamin Water (different flavors), etc.

The next two numbers are the value code.

In the case of the example here, 01 means buy two, get one free, and then, the last number is a check-digit

If you want more information about coupon codes, go to www.couponpros.org

Barcodes for Greeting Cards

There are two different styles of UPC Barcodes for Greeting Cards.

1) A Standard 12-Digit UPC Barcode
2) A 12-Digit UPC Barcode with a 5-digit add-on.

For all but the largest of Greeting Card companies, we recommend using a standard 12-digit UPC Barcode (U.S./Canada) or a 13-digit EAN Barcode (outside of U.S./Canada) and NOT the barcode with add-on.

When the add-on is used by the large Greeting Card manufacturers, they have the staff and resources to perform physical inventory counts and provide timely reporting to their customers. The 12 digit barcode is used for each price point or for each category and price point. The store scans the 12-digit barcode only. The Greeting Card manufacturer sends their representatives into the stores and they manage inventory and restocking of the cards based on predetermined inventory levels and buying commitments.

Some smaller Greeting Card manufacturers use one barcode for each variation of price or one barcode for each category and price. This will convey the pricing information to the retailer's point of sale system but will not allow for the most accurate inventory tracking. We recommend one barcode on each different card to allow for the most detailed tracking and reorder opportunities.

We endorse using a unique 12-digit barcode number (and graphic) for each Greeting Card that you manufacture and sell. This gives the most detailed information to the retailer when they track sales as it creates a clean reorder path at the SKU (Stock Keeping Unit) level.

Barcodes for Music

Barcodes for music, whether physical products like vinyl or CDs or for Digital Albums are exactly the same type of barcodes used for other products.

Nationwide Barcode is the suggested supplier for Pandora for digital distribution and is the largest supplier of Barcodes for Amazon Resellers. We provide both UPC and EAN barcodes. UPCs are used throughout the US and Canada and can be used for digital sales worldwide. EANs are used outside of the US/Canada and are a subset of the UPC barcode.

CDs and Digital Albums only need one UPC barcode regardless of the number of tracks on the album. If you are going to be selling both a physical CD and a digital album, you will need a different barcode for each. The purpose of the barcode is to electronically help a retailer track sales and insure that the correct price is charged for the item being sold. Since a physical CD and a digital album are two different things, they need to be tracked differently.

It used to be that the second to last number was used to designate a type of product: 2 for CDs, 4 for cassettes, 1 for vinyl LPs, or 7 for vinyl 7-inches. This was a recommendation by the RIAA and this is no longer valid. The second to last number can be 0-9 for any music product. There is no difference between barcodes for music and any other product.

Digital Albums
If you are selling a digital album and are also selling individual tracks from that album, one barcode is all you need and may want to add ISRC codes during the mastering process.

The UPC or EAN barcode represents the entire digital product. The UPC/EAN number can be embedded (but is not required) into the digital album at the mastering stage. The barcode is also attached to the album in some way, either by your graphic designer at the time you are creating your physical album artwork, or after the fact by affixing labels.

ISRC codes are used to track the sales of single tracks through digital distribution outlets like iTunes. An ISRC (International Standard Recording Code) is a unique ‘digital fingerprint’ that stays with an individual recorded track, no matter whether there are any changes in the ownership of the track.

All of the ISRC’s should be added to your recording when you are mastering the album. They can also be added at the time of encoding by the digital aggregator or distributor used to deliver your recorded content.

The ISRC codes also help to track plays/royalties through Internet and Satellite radio.
You can apply for an ISRC code from USISRC.ORG.

Barcodes for Books

Books require ISBN numbers. "ISBN" stands for "International Standard Book Number". An ISBN is a number, not a bar code. The Symbology is the same as an EAN

One agency per country is designated to assign ISBNs for the publishers and self-publishers located in that country. The U.S. ISBN Agency cannot assign ISBNs to publishers and self-publishers located outside the United States and its territories.

The ISBN identifies the title or other book-like product (such as an audiobook) to which it is assigned, but also the publisher to be contacted for ordering purposes. If an ISBN is obtained from a company other than the official ISBN Agency, that ISBN will not identify the publisher of the title accurately. This can have implications for doing business in the publishing industry supply chain.

ISBNs are assigned to publishers and self-publishers as follows: 1, 10, 100, 1,000, 10,000 or 100,000 numbers.

When participating in the ISBN standard, publishers and self-publishers are required to report all information about titles to which they have assigned ISBNs.

For Information about ISBN Numbers:
United States: http://www.isbn.org
Canada http://www.writing.com/main/view_item/item_id/744404-Canadian-ISBN-How-to-Get-One
Europe: http://book.coe.int/EN/
Australia: http://www.thorpe.com.au/isbn/

Barcodes for Magazines

If you are selling your magazine in a local stores, a UPC or EAN barcode should be fine. If you are looking at using a distributor, one of your first questions is whether or not the distributor requires a BIPAD number.

The following is from George Laurer's Website (http://bellsouthpwp.net/l/a/laurergj/upc/bipadplus.html)

The BIPAD number is essentially a standardization of the 5 digit item code that is assigned by the owner of the Company Prefix. In other words, the publisher purchased the 6 digit prefix from GS1 (then called UCC) to which he added the 5 digit BIPAD number (standardized item number) and the check digit. A different item number would be used for each issue, and for each price. The objective of this was to provide a means to collect sales and movement data. According to the Magazine Retail Advisory Council Unique Universal Product Code Impact Statement released March 1, 1999 by the Herman Consulting Group, inc. such a scheme would increase the number of required 12 digit U.P.C. symbols by 19 fold.

Although there was significant impact on the retailer in the amount of numbers he had to store in his in store computer, the system was workable. However in April of 2002, GS1 (then UCC) recognized that the quantity of U.P.C. number was finite and that assigning 6 digit prefixes to all new publishers was extremely wasteful of this limited resource. Consequently they stopped issuing 6 digit prefixes and began assigning only variable length company prefixes which in turn allowed only a 2 digit item number in most cases. The 5 digit BIPAD number could not be used with the variable length prefix. The magazine industry began a communications campaign to inform the wholesalers and distributors of the change. Unfortunately, some Wholesalers and Distributors are not standards compliant and continue to assume BIPAD is the only means to communicate information about magazines.

Today, new publishers may make a business decision to turn over distribution of the magazine to a wholesaler. If they elect to let the Wholesaler manage the information, there is no need for them to own a Company Prefix from GS1 or any of the "resellers". They would then apply to Harrington Associates for a BIPAD number. The Wholesaler, not the publisher, would then use their own 6 digit Company Prefix (Wholesalers and Distributors are also members of GS1 US) along with the 5 digit BIPAD number assigned by Harrington Associates and encode it in a U.P.C. The wholesaler then releases the product for sale in the retail channel. The BIPAD number though is no longer the complex number which was to be unique for each issue and price, but is simply a single number per title.

The long and the short of this is that the BIPAD provides no advantage to the publishing industry over the standard U.P.C. because it is only unique to the title and provides no additional information. There is no reason to have a BIPAD number and a number issued by either GS1 or a reseller. The bottom line is that the Publisher must make the business decision as to how their magazine will be distributed. Note that not all Wholesalers require a BIPAD number. The numbers now being assigned by GS1 or those from a reseller, cannot accommodate the 5 digit BIPAD number.

Shipping Container Barcodes

A Shipping Container Barcode is used on the outside of our master cartons and recommended or required by many mid-to large retailers who are automating their incoming inventory processes.

The UPC Shipping Container Symbol (SCS) is very similar to the Universal Product Code. This symbology is called interleaved 2 of 5 (ITF). The major difference between this barcode and a UPC barcode is the lines at the top and bottom of the barcode. These are called Bearer Bars.

The Barcode is comprised of 4 groups.

1. Packaging Indicator. We recommend that you assign a number ranging from 1 to 7 for the first digit. If you have a container that has 12 and another container that has 36, you assign different numbers to each. This is very flexible.
2. The next number is a ZERO. This is required.
3. The next 11 digits are the first 11 digits from the UPC barcode used for the item inside.
4. The final (14th digit) is a check digit.

UPC Databases

There are several databases available and none of them are complete.

There are new products created every day and they come from giant manufacturers and from home-based entrepreneurs.

Here is a partial list of databases and their purpose:

- UPC Database – www.upcdatabase.com This is an informal database created as a college project and is now a hobby project There are over 1,000,000 items in the database. Although this sounds like a lot, it barely scratches the surface. This database allows you to enter in a UPC or EAN number and see who manufactures the product. It does not allow you to enter a product and get a UPC code.

  UPC Data - http://upcdata.info Another hobbyist site

- Google Merchant Center – This is an interesting database since they feed this information to Red Laser and the Google and Android phone barcode applications http://www.google.com/merchants

- GS1- This database is good for locating company codes. Very few products are listed. http://gepir.gs1.org/v31/xx/

- UPCBarcodes.com – This site allows you to upload your product information along with the UPC code with the purpose of pushing information to the internet search engines and barcode scanning applications.

Although there are no "official barcode databases" where retailers pull information, these databases can help to secure your products and your UPC barcodes in the marketplace.

Barcodes and your Cell Phone

There are a lot of barcode scanners available for smartphones. The majority of the applications are for iPhones, however more and more are coming to Windows, Android and other phones with a camera and internet access.

It's cool, it's fun and it's a way for your customers to find you on their mobile device. It's a way for them to locate your items at the best price or closest to them.

Our opinion is that the 3 best applications are ShopSavvy, Red Laser and Barcode Hero.

ShopSavvy has added a lot of great features to their scanner including a title search making it one of our personal favorites. Your customers enter in the name or manufacturer and a variety of items come up to help them narrow the search and locate the item locally (if applicable) or on-line. http://shopsavvy.mobi/

RedLaser has one of the better scanners however you need to have the barcode graphic in front of you in order to scan it. This application doesn't allow for search by name. It reads EAN, UPC, ISBN and the latest version will also work as a QR barcode reader. http://redlaser.com/

As these applications become more robust and useful for users, each one of the companies who have developed these applications will make their more feature-rich.

All of these applications pull data from a variety of sources, however the common denominator to all of these applications is using the database located at http://www.upcdatabase.com

Are Barcodes the "Mark of the Beast"?

666 is not embedded in a barcode -- The short answer is "no"

The longer answer follows: Some people have taken the following passage from Revelation 13 to support their claims that the barcode had 666 embedded into it.

Revelation(17) so that they could not buy or sell unless they had the mark, which is the name of the beast or the number of its name. (18) This calls for wisdom. Let the person who has insight calculate the number of the beast, for it is the number of a man. That number is 666.

Barcodes are all database driven. The barcode only represents a series of numbers containing a prefix, item numbers and a check digit. We'll discuss the intricacies of barcodes in subsequent chapters.

The numbers corresponding to the barcode are scanned or entered into a database exactly as indicated below the barcode (the human readable numbers). Along with the barcode number, the information relating to the product including 'regular' and 'sale' price is also entered. When an item is scanned, the information is pulled from the database and the customer is charged the proper amount of money, at the same time, inventory is adjusted downward.

There are the three sets of guard bars, two bars on the far left, the far right and in the middle. Since these guard bars appear three times in a barcode, and look similar to the number 6, some people have claimed that the pattern 6-6-6 was embedded in every barcode.

According to Mr. Laurer, the inventor of the UPC/EAN barcode, "There is nothing sinister about this nor does it have anything to do with the Bible's mark of the beast. Each character is a fixed length, 7 modules and composed of two spaces and two bars. From the outer ends toward the center, the character starts with a space and therefore a single bar is required to 'close' the character. The other bar is used to allow the level setting (gain) circuitry to adjust to the contrast of the particular symbol. The center pattern is narrow space, narrow bar, narrow space, narrow bar. This pattern is 4 modules wide and distinguishes it from the a 7 module character thus giving direction and end information to the logic. The assignment of digits to specific patterns was arbitrary.'

Sources: http://www.laurerupc.com/ and common sense.

QR Codes

A QR Code is a matrix barcode (or two-dimensional code), readable by QR scanners, mobile phones with a camera, and smartphones. The code consists of black modules arranged in a square pattern on white background. The information encoded can be text, URL or other data.

Common in Japan, where it was created by Toyota subsidiary Denso-Wave in 1994, the QR code is one of the most popular types of two-dimensional barcodes. QR is the abbreviation for Quick Response, as the creator intended the code to allow its contents to be decoded at high speed.

A QR Code can be printed on a product, sign, apparel, embedded on a website and once scanned can direct the person to get more information about your service or product.

Best Buy has QR Codes next to pricing information of their electronics right in the store. Quickly scan the QR Code and you have information about the product along with product reviews.

Other applications are to point people to product or contact details, special offers, events details, a coupon, a free download, point people to twitter, Facebook, your Blog, My Space or a link to a YouTube Video. This information is stored on the mobile device so that they customer can refer to it again and again.

Not all customers will use this feature, but it will be a differentiating mark between you and your competition. Those who do use this technology will see it as a way of gaining more information about your product and service.

The simplest way to implement this is to print the QR code on your business cards, promotional materials, on your website, etc. and have it point to a landing page. We can also work with you and your web designer to create a landing page that you use to capture information and point the client to specials or links to your social media pages where you can further enhance the customer experience.

There are a number of QR code readers available for Droid and iPhones.

For more information:
http://www.mmiscan,com

Q&A

What is the difference between SKU, UPC, EAN, Barcode, GTIN, GTIN-12 and GTIN-14

SKU stands for Stock Keeping Unit and is pronounced “skew” A SKU number is a number or a string of numbers and letters that uniquely identify a product. SKUs are also called part numbers, product numbers or product identifiers. You can use the UPC as the SKU but usually this is a different set of numbers created by the manufacturer.

GTIN stands for Global Tracking ID Number. This is a family of data structures. The number that is encoded into a barcode is the GTIN. The type of barcode is UPC or EAN. These can be used interchangeably.

GTIN Data Structure	Legacy Terminology	Symbology (Barcode Type)
GTIN-12	UPC, UPC-A, UCC-12	UPC-A
GTIN-13	EAN, JAN, EAN-13	EAN-13
GTIN-14	SCC-14, SCCC, UCC-14, UPC Case Code, Shipping Container Code	ITF (Interleaved Two of Five)

UPC stands for Universal Product Code: It is a 12 digit number. These are used in the United States and Canada
EAN stands for International Article Number (formerly European Article Number.

What is a barcode?

A bar code also known as a Universal Product Code is a unique 12-digt code that allows wholesalers and retailers to track the sales of your product. This allows them to manage inventory and to sell your products at their Point of Sales Systems (cash registers)

How does a barcode work?

When you sell your products to a wholesaler or retailer (Amazon, Target, Borders Books, Autozone, etc.), they will have you fill out a product information sheet. One of the things that you put on that sheet, is your company and product information including the 12-digit UPC code number. Then, the wholesaler or retailer enters this information in their information systems computer. This computer ties into the registers at the front of the store. The cashier scans your item and the information comes up. Every time an item is scanned and sold, it deducts the number of items sold from their inventory.

What information is in a barcode?

The only thing that is in a barcode is the representation of the numbers. When a barcode is scanned, the computer reads the number and then looks up the information from within a database.

How many Bar Codes do I need?

You need as many barcodes as you have products or variations of products. If you are selling shoes, you would need one for each style, color and size. If you are selling soft drinks, you would need one for the 12 oz. can, the 12 oz. bottle, the six or twelve-packs, and the liters of each flavor. Every variation needs a unique barcode.

What countries will UPC barcodes work in?

UPC bar codes work everywhere that either UPC or EAN bar codes are scanned which includes the United States, Mexico, Canada, Australia, the UK, Asia, South America and the Middle East.

What's the difference between a UPC and a UPC barcode?

A UPC Code is the number itself whereas the barcode is a UPC-A barcode symbology.

What's a symbology?

This is a term for the graphic style of a UPC barcode. There are a lot of different styles of barcodes, but the main one for retail is a UPC-A (12 digit barcode)

How accurate is a Barcode?

Very accurate. Barcodes have check digits at the end (the 12th number). The barcode scanner calculates what the last number should be and if it doesn't match, it gives a "item not found".

Is there data encrypted within a barcode?

No. The bar code bars represent only the 12-digit number. There is no other information contained within the bar code. All information is supplied to you to the wholesaler or retailer.

What size does the barcode need to be?

UPC symbols are scanned by retail omni-directional scanners. This means that UPC symbols have a fixed relationship between symbol height and width. When one dimension is modified, the other dimension should be altered by a proportional amount.

Should I reuse a barcode number?

This can be tricky as it causes a lot of work for your retailers. Some retailers, like Amazon, do not allow you to change or update numbers with a new product. All in all, barcodes are relatively inexpensive and are not worth the confusion that is created.

Glossary

A

Accuracy Term used for bar code verification. Accuracy determines whether any element width, or inter-character gap width, differs from its nominal width by more than the printing tolerance.

Adhesive Portion of a pressure sensitive label allowing for the label to be affixed to its intended surface…the sticky side of the label.

Alignment Relative position and orientation of a scanner to the barcode symbol.
Alphanumeric Character set consisting of letters and numbers.

ASCII Character set described in the American National Standard Code for Information Interchange. ASCII codes represent text in computers, communications equipment, and other devices that use text.

Aspect ratio Ratio of bar code symbol height to symbol length.

Asynchronous communication Every character transmitted has special bits attached, telling the receiving device when the data begins and ends.

Auto discrimination Ability of bar code scanning/decoding equipment to recognize more than one symbology.

Average Background Reflectance A bar code verification term expressed as a percent.

B

Backcoating Thermal transfer ribbon use backcoating to keep the ribbon from sticking to the printhead and label material. This protects the printhead from damage caused by excessive heat, static, and abrasion.

Background Spaces, quiet zones, and areas surrounding a printed symbol.
Bar The lines or darker elements of a printed bar code symbol.

Bar Code Character A single group of bars and stripes that represents a specific quantity of ASCII characters.

Bar Code Density The number of characters that can be represented in a linear unit of measure. This number is often expressed in characters per inch or cpi.

Bar Code Reader Any device that can read a bar code (light pen, laser gun, fixed scanner, etc.).

Bar Width Thickness of an individual bar measured from edge to edge.

Bi-directional Barcode symbol that can be successfully read in either direction.

Bipad The BIPAD numbering system is unique to the retail magazine business.

Bitmapped Font Character/font sets printed by a thermal printer and are typically available in limited point sized: .6, 8, 10, 12, 14, and 18 point.

C

Character Alignment The vertical or horizontal position of characters.

Character Density The number of data characters per unit length

Character Font The type and style of data characters available for a particular thermal printer model.

Character Set A range of data characters (alpha, numeric, and/or punctuation) that can be encoded into any given symbology.

Check Character/Digit A mathematical algorithm that has been created for the purpose of performing a mathematical check to ensure that a barcode has been scanned and read correctly.

CODABAR Originally developed by Pitney Bowes, the Codabar Barcode is used primarily by US Blood Banks, Photo Labs and Overnight Delivery Services. Codabar can encode the numbers 0 through 9, the start/stop characters A, B, C, D, E, *, N or T. and the six symbols (-:.$/+).

Code 2 of 5 Also called Interleaved Two of Five or ITF - Interleaved 2 of 5 is a continuous two-width barcode symbology encoding digits. It is used commercially on 135 film and on cartons of some products, while the products inside are labeled with UPC or EAN.

Code 11 Barcode Code 11 is a barcode symbology developed by Intermec in 1977. It is used primarily in telecommunications. The symbol can encode any length string consisting of the digits 0-9 and the dash character (-). One or more modulo-11 check digit(s) can be included.

Code 39 Barcode Full alphanumeric bar code. Code 39 is the standard for many industries, including adoption by the U.S. Department of Defense for its LOGMARS specification.

Code 49 Barcode Very compact variable bar code type capable of encoding the full 128 ASCII character.

Code 93 Barcode Code 93 is a barcode symbology designed in 1982 by Intermec to provide a higher density and data security enhancement to Code 39. It is an alphanumeric, variable length symbology. Code 93 is used primarily by Canada Post to encode supplementary delivery information. Every symbol includes two check characters.

Code 128 Barcode Code 128 is a very high-density barcode symbology. (A special version of it called GS1-128 is used extensively world-wide in shipping and packaging industries.) It is used for alphanumeric or numeric-only barcodes. It can encode all 128 characters of ASCII and, by use of an extension character (FNC4), the Latin-1 characters defined in ISO/IEC 8859-1.

Continuous Media Label, ticket, or tag stock media that does not contain any notches, gaps, or holes between each label.

CPI Characters Per Inch.

D

Data identifier Message prefixes in a bar code that define a category or intended use of the data that follows the identifier.

Decoder This is the part of the barcode reader that processes the signals and interprets them into usable and meaningful data.

Depth of Field Minimum and Maximum distance in which a scanner is capable of reading bar codes.

Diffuse Reflection A bar code verification term. Diffuse reflection is the reflection of light from a surface such that an incident ray is reflected at many angles rather than at just one angle as in the case of specular reflection. An illuminated ideal diffuse reflecting surface will have equal luminance from all directions in the hemisphere surrounding the surface.

DPI Dots Per Inch. This defines printing resolution of thermal and laser printers.

E

EAN European Article Numbering system (also known as International Article Number and GTIN13). This is similar to the UPC (Universal Product Code) system used in the US and Canada. The EAN is a 13 digit system including a country code. Nationwide Barcode provides EAN barcodes

EAN-13 EAN-13 has 13 characters. See EAN (above). There are variants of the EAN-13 barcode which include a 2 or 5 digit extension barcode.

EAN-8 EAN-8 has a left-hand guard pattern, four odd parity digits, a center guard pattern, four even parity digits, and a right hand guard pattern with a total of eight symbols.

Element A single bar or space in a bar code.

F

Facestock The part of the substrate (media) where printing occurs.

Federation of Automated Coding Technologies. (FACT)FACT was formed to foster interindustry communications and coordination relating to barcode standards.FACT maintains a database of specifications and data identifiers.

First Read Rate Bar code verification term. The ratio of the number of successful reads to the number of attempts. Commonly expressed as a percentage. Abbreviated as FRR.

Fixed beam scanner A visible light or laser scanner that requires a more exact positioning of a bar code than a moving beam scanner.

Function code Function (FNC) codes define instructions for a bar code reader decoding Code 128 bar codes. FNC 1, for example, is a required component of the UCC-128 specification. FNC 2 tells the reader to store the data read and transmit it with the next symbol. FNC 3 is reserved for code reader initializing and other reader functions. FNC 4 is reserved for future use.

G

GS1 Founded in 1977, GS1 is an international association dedicated to the development and implementation of global standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across multiple sectors. The GS1 System of standards is the most widely used supply-chain standards system in the world. Nationwide Barcode received their barcodes from the GS1 prior to August of 2002 when their prefixes were grated grand-fathered status allowing them to resell to consumers.

GTIN GTIN is an “umbrella” term used to describe the entire family of GS1 data structures for trade items (products and services) identification. GTINs may be 8, 12, 13 or 14 digits long, and each of these 4 numbering structures are constructed in a similar fashion, combining Company Prefix, Item Reference and a calculated Check Digit.

GTIN 8 An 8-digit number used predominately outside of North America. The barcode format for this is EAN-8.

GTIN 12 A GTIN 12 is a 12-digit number used primarily in North America (The barcode format for this is UPC-A)

GTIN 13 The 13-digit number used outside of North America – the barcode format for a GTIN13 is the EAN-13.

GTIN 14 A GTIN 14 is primarily used as a shipping container barcode using a ITF symbology to create the barcode.

Guard Bars Bars at the ends and center of a UPC or EAN bar code used as reference points for reading the barcode.

H

Hand-Held Scanner Scanning device to read barcodes.

Heat Resistance The properties of a label which prohibits damage due to high temperatures. These damages can be physical or chemical changes to the material.

Horizontal bar code A bar code type presented in such a manner that its overall length dimension is parallel to the horizon. The bars are presented in an array which looks like a picket fence.

I

Infrared laser diode Used in some hand laser scanners to project a light beam.

Infrared The band of light wavelengths too long to be seen by the human eye. Used in access control and security applications where bar code fields must not be visible by human eye — only to an infrared scanner.

Ink Jet Printing Type of computer printing that that creates an image by propelling droplets of ink onto paper of other substrate. High end inkjet printers are often used in corrugated boxes where the barcodes are made very large so dot placement accuracy is not as critical.

Interleaved 2 of 5 High density, numeric bar code type in which each character is composed of five elements

ISBN-13 The International Standard Book Number (ISBN) is a unique numeric commercial book identifier based upon the 9-digit Standard Book Numbering (SBN) code created by Gordon Foster, Emeritus Professor of Statistics at Trinity College, Dublin,for the booksellers and stationers W.H. Smith and others in 1966. (Wikipedia). Books often have a 5 digit add-on indicating the price of the book.

ISMN The International Standard Music Number (ISMN) is a unique number for the identification of all notated music publications from all over the world (excluding the US), whether available for sale, hire or gratis– whether a part, a score, or an element in a multi-media kit.

ISSN Barcode Used mainly throughout Europe, The ISSN (International Standard Serial Number) identifies periodical publications as such, including electronic serials. The ISSN is a numeric code which is used as an identifier: it has no signification in itself and does not contain in itself any information referring to the origin or contents of the publication.

ITF14 Also known as a GTIN 14
The ITF14 is a 14 digit barcode used to mark the master shipping containers of products with a UPC identifier. It is based on the I2of5 barcode. ITF14 barcodes usually contain a top and bottom bar (sometimes rectangle) called the Bearers bar.

J

JAN Japanese Article Number – Name used for the EAN system in Japan

K

L

Label Thickness The ideal range of media/substrate thickness o promote optimum print quality and performance.

Label, Pressure Sensitive Pressure sensitive adhesive (PSA, self adhesive, self stick adhesive) is adhesive which forms bond when pressure is applied to adhere the label or other item to the adherent. No solvent, water or other component is required.

Label, Transparent A pressure-sensitive clear label.

Ladder bar code printed in a rotation perpendicular to the horizon so that the individual bars appear as rungs on a ladder. Vertical bar code.

Laminate To apply one layer of material over another. A clear laminate protects the surface of a printed item or label/

Laser Printing Laser printing is a digital printing process that rapidly produces high quality text and graphics on plain paper. The pressure from the printhead and drum then fuse the image to the paper, creating the image. Laser printed labels are only as durable as a paper photocopy.

Laurer, George Inventor of the UPC barcode. George Joseph Laurer (born September 23, 1925 in New York, NY) developed the Universal Product Code in 1973.[1] As an engineer at IBM he was asked to develop the pattern used for the Universal Product Code. A 36-year veteran of the International Business Machines Corporation (IBM) who retired in June 1987, George Laurer is the holder of 25 patents. He is also the author of 20 published Technical Disclosure Bulletins. (wikipedia)
George Laurer's sites:
Laurer UPC: http://www.laurerupc.com/
Authenticated UPC Directory:
http://authenticatedupcregistrationdirectory.org/

LED Light-emitting diode. The light source often used in light pens.

Light pen A scanning device which is used as a hand held bar code reader, also known as a wand. Requires direct contact with the image.

LOGMARS Logistics of Marking and Reading symbols. A Department of Defense marking specification.

M

Machine-Readable
A general term used for printed material that can be scanned and directly transferred to a data processing system.

Manufacturer's ID With a UPC, the first 6, 7, 8 or 9 digits of the barcode.

Media Refers to the label, tag, or other substrate used – the surface on which a barcode symbol is printed.

Media Roll Capacity The maximum/minimum roll diameter that a thermal printer can accommodate, for example 5.0" O.D. (Outer Diameter) and 1.0" I.D. (Inner Diameter).

Mil One one-thousandth of an inch (0.001″). Unit of measurement used in bar code specifications.

Misread A condition when the reader/decoder does not agree with the data encoded in the bar code field.

MSI Barcode MSI (also known as Modified Plessey) is a barcode symbology developed by the MSI Data Corporation, based on the original Plessey Code symbology. It is a continuous symbology that is not self-checking.

Module The width of the narrow bars in a bar code.

Moving beam scanner
A device where scanning is achieved by mechanically moving a light beam through the bars of a bar code field.

N

Nanometer Unit of measure used to define the wavelength of light.

Net Data Density The net data density of a linear bar code symbol is determined by dividing the number of characters in the symbol by the overall symbol length

Nominal Tolerances are specified as positive and negative deviations.

O

OCR Optical Character Recognition. Technology for machine reading of human readable text.

On-Demand A printing term (also for labels) describing how printing is done. On-demand usually incorporates a digital printing process as opposed to a long run printing process utilizing negatives or plates and the requirements of long run printing.

One-Dimensional Bar Code A complete message is expressed by a single line of bars. Also linear barcode.**Operating Temperature** Prescribed temperature range for the safe operation of a thermal printer.

Orientation The alignment of a bar code symbol with respect to horizontal.

Optical throw Minimum distance a bar code can be away from a scanner and still be read.

Orientation The orientation of the barcode, such as horizontal with vertical bars and spaces (picket fence) and vertical with horizontal bars and spaces (ladder). The fixed number of characters required for start, stop, and checking in a given bar code symbol. Overhead

P

Pacific Barcode Located in Temecula, CA, Pacific Barcode is the premier source for preprinted labels, equipment (scanners, printers, etc.) and supplies: http://www.pacificbarcode.com

PCS A bar code verification term. Print contrast signal.
Measurement of the ratio of the reflectivity between the bars and spaces of a bar code field, commonly expressed in percent.

Permanency A measure of an adhesive's ultimate holding power or bond strength.

Permanent Adhesive An adhesive that has the strongest possible bond with the item.

Pharamacode Pharmacode, also known as Pharmaceutical Binary Code, is a barcode standard, used in the pharmaceutical industry as a packing control system.

Picket fence A bar code whose length is printed horizontally and the bars are presented in an array which looks like a picket fence.

PLU Price look-up codes, commonly called PLU codes, PLU numbers, PLUs, produce codes, or produce labels, are identification numbers affixed to produce in grocery stores and supermarkets to make check-out and inventory control easier, faster, and more accurate. The code may be a four-digit number, currently in the 3000–4999 range, identifying the type of bulk produce, including the variety, or a five-digit number. (wikipedia)

Point of Sale (POS) Refers to the Electronic Cash Register in a retail business.

Polyester A strong film having good resistance to moisture, solvents, oils, and many other chemicals.
Polyethylene A tough, sturdy plastic film having very good, low temperature characteristics.

Polypropylene Similar to polyethylene but stronger, with a higher temperature resistance. Often used in the creation of Zebra media.

Postnet Code A bar code symbology used primarily by the U.S. Postal Service for mail sorting. All bars and spaces are the same width. ZIP Code information is encoded into the particular arrangement of tall and short bars.

Print Quality A bar code verification term. The measure of compliance of a bar code symbol to the requirements of various qualities of the barcode.

Pressure Sensitive Label Pressure sensitive adhesive (PSA, self adhesive, self stick adhesive) is adhesive which forms bond when pressure is applied to adhere the label or other item to the adherent. No solvent, water or other component is required.

Q

QR Code A QR code (quick response) is a two-dimensional bar code developed for use in Japan that permits the encoding of binary, Kanji, and alphanumeric information. They have been adapted for a variety of marketing applications.

Quiet Zone A clear space which precedes the start character of a bar code field and follows the stop characters. Sometimes called the “clear area.”

R

Read rate Bar code verification term. The ratio of successful bar code reads to the total number of attempts.

Reflectance A bar code verification term. The ratio of the amount of light which is reflected back from the white spaces of a bar code during scanning to the amount of light reflected under similar illumination conditions.

Ribbon A cloth or plastic tape coated with several layers of material, one of which is ink-like, that produces the visible marks on the the material to be printed.

Residue Adhesive left on a substrate when a decal is removed.

Resolution The higher the resolution the better the print quality. Measured in dots per inch (dpi).

S

Scanner An electro/optical device that converts the bars and spaces of a bar code field into electrical signals.

Service Temperature The temperature range that a pressure sensitive label will withstand after a 72-hour residence time on the substrate. The range is expressed in degrees Fahrenheit and/or degrees Celsius.

SSCC18 Barcode This Symbology is also known as UPC-128 Shipping Container Code, Code 128 UPC Shipping Container Code, Serial Shipping Container Code, UCC-128, EAN-18, NVE (Nummer der Versandeinheit)

Substitution error rate. The rate of occurrence of incorrect characters.

SKU Stock Keeping Units. In a distribution/retail environment, a generic term for item or part number.

Soundscan Nielsen SoundScan is an information and sales tracking system created by Mike Fine and Mike Shalett. Soundscan is the official method of tracking sales of music and music video products throughout the United States and Canada. Data is collected weekly and made available every Wednesday to subscribers, which include executives from all facets of record companies, publishing firms, music retailers, independent promoters, film and TV, and artist management. SoundScan is the sales source for the Billboard music charts, making it the official source of sales records in the music industry. (wikipedia)

Space width The thickness of a space measured from the edge closest to the symbol start character to the trailing edge of the same space.

Spectral Response Bar code verification term. The variation in sensitivity of a test surface to light of different wavelengths.

Stacked code Where a long bar code field is broken into sections and “stacked” one upon the other, resulting in codes that are extremely compact.

Start-stop character A special bar code character that provides the scanner with start and stop reading instructions as well as scanning direction indicator.

Symbol A combination of bar code characters, including start/stop characters, quiet zones, data characters, and check characters required by a particular symbology.

Symbol Length The distance between the outside edges of the quiet zones on the two ends of a bar code field.

Symbology Bar code type.

T

Thermal direct Printing method where dots are selectively heated and cooled and dragged upon heat-sensitive paper. The paper turns dark in the heated areas. Thermal Direct paper or labels can turn dark if exposed to direct heat or sunlight.

Thermal transfer A printing method like thermal direct except a one-time ribbon is used. This eliminates the problems of fading or changing color inherent in thermal direct printing.

U

UCC Uniform Code Council – formerly the Uniform Product Code Council, now referred to as the GS1. Where all barcodes originate. There are a number of legal resellers including Nationwide Barcode. http://www.nationwidebarcode.com

UPC Universal Product Code. The standard bar code type for retail products in the United States.

UPC-A A fixed length, numeric, bar code type used primarily in the retail industry for labeling packages. There are two additional variations of the UPC-A barcode. One having a two digit extension and the other having a 5 digit extension. The 2 digit extension is used by magazine and publication publishers and the 5 digit by greeting card manufacturers.

UPC-E A UPC-E barcode is a shortened representation of a UPC-A. It reduces the data length from 12 digits to 6 digits by compressing the extra digits. Not all UPC-A barcodes can be converted to UPC-E.

V

Vector Vector images are made up of many scalable images and are defined by mathematical equations so they can render at the absolute highest quality/ This objects can consist of lines, curves, shapes with editable characteristics.

Verifier A device that makes measurements of the bars, spaces, quiet zones and optical characteristics of a bar code field to determine if the code meets the requirements of a specification or standard.

Vertical bar code A bar code field printed in a rotation perpendicular to the horizon so that the individual bars appear as rungs on a ladder.

Visible laser diode Used in some hand laser scanners to project a beam of light visible to the human eye, simplifying the scanning process.

Void A printing and bar code verification term. An undesirable absence of ink in a bar.

W

X

X-dimension The width of the narrow bars and spaces in a bar code type; usually measured in mils.

Y

Z

Zebra (Brand) A thermal print technology company intent on providing innovative labeling solutions and quality products of renowned reliability to its customers.