AIDC Memoirs

by

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Chapter I. - Introduction

In 1968, I did not know the difference between a bar code and bars on a jail! Although I did not realize it at the time, fate played an ironic twist and a foundation was established that would serve the balance of my business career.

For more than 35 years, I have had the wonderful pleasure of meeting some outstanding people and enjoyed memorable experiences while making good friends. My travels have taken me to all 50 states, six continents and nearly 50 countries. This journey has accumulated more than 4 million frequent flyer miles! I have experienced the roles of technician, marketing, consultant, educator and facilitator. More than 20,000 people have heard my enthusiasm for dynamic technologies!

As the sun begins to set on this remarkable voyage, it is hoped that these memoirs will encourage many of my peers to do the same so as to preserve much of our illustrative industry's history. This narrative includes many personal aspects of this business experience for this is where I have gained so much and why I am so grateful.

Chapter II. - The Beginning

While working for Retail Systems Development in 1968, my boss Len Solganik at NCR gave me a new assignment. For the next two years, I was buried in the bowels of Rike's in Dayton, Ohio. At the time, Rike's was one of the leading department stores in the United States. In some ways, I felt quite at home as earlier in my career, I had worked there for nearly 12 years.

My assignment was to perform extensive research for what was to become one of the world's first department store platforms for the combination of electronic point-of-sale and automatic data collection systems. Although quite interesting, working extensively behind the scenes in a receiving and marking area was not a lot of fun. Especially on hot summer days! Despite the fact that a lot of time had been spent in this area while a buyer at Rike's, much was to be learned in terms of defining an automatic data collection system that NCR was in process of developing.

One might ask, "why the receiving and marking area?" Quite fundamental. To this day, any successful implementation of a system that incorporates bar coding must depend on the timely and accurate marking of items at some point in the supply chain. In today's environment, much of this is done at the manufacturing level with great cooperation on the part of suppliers. In those days, manufacturers knew nothing of this technology and, once they did, wanted no part of additional costs and responsibilities of labeling merchandise with bar codes! Needless to say, times have changed. Now they are willing partners, as they have also become substantial beneficiaries of the technology.

In the meantime, it was necessary to properly define how a bar code was going to be printed and then attached to multiple types and shapes of merchandise. The product value had to be taken into consideration as part of this process. Then came the challenge of what to do with the information once it was automatically captured at the point-of-sale. In those early years, computerized retail inventory control systems were virtually non-existent. Certainly in the terms that we understand in modern times.

Thus the challenge. What was to be marked, in what manner and with what data? Those were the fundamental questions that had to be answered in that initial research project. Those were truly pioneering times.

Chapter III. - NCR's Proprietary Color Bar Code

In 1971, NCR had one of the most significant product releases in its' history. At the Doral Country Club in Miami, a very formal press release was made regarding the 280 Point-of-Sale terminals and associated Color Bar Code system. The fruits of my prior three years' labor (along with many others) were now there for the picking.

NCR's Color Bar Code (CBC) system incorporated a transitional code consisting of green and black bars printed on a white background. For historical purposes, it should be noted that the original color combination was green, red and white. As a major client, Sears Roebuck executives were consulted early in the development stage and they provided a negative response stating that it looked too much like a Christmas tree! Thus the colors were changed (or so the story goes.)
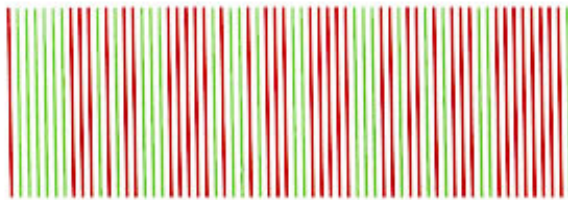
Original Color Scheme   Final Color Scheme

The CBC encoding scheme was binary with data characters given in binary coded decimal. However, each color did not represent a binary value, nor did each bar represent a binary bit. Instead, the transition from one bar to the next, which had to be different, represented a binary bit. The direction of the transition determined the binary value of that bit. Thus a transition from a white bar to a green bar, or green to black, or black to white was read as a binary 0, while a transition from a green to white, or white to black, or black to green was read as a binary 1. Of course, the use of binary "1's" and "0's" transposes into a language that computers can readily understand.

For reading, CBC employed the use of a contact wand. The printing of this code was accomplished with the infamous NCR manufactured 747 tag printer. It was a monster that had a gargantuan selling price of $10,000 per copy! This was right in the face of the fact that retailers traditionally spent in the range of $200 to $300 for a ticket printer. Talk about a marketing challenge!
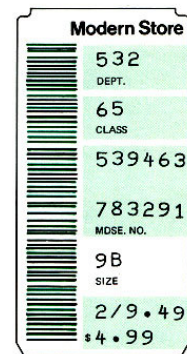
All was not bad for it had some features that were quite an asset for this kind of system. For one, it had an on-board verification feature. Every single ticket that was printed was also scanned internally and rejected if not printed correctly with the transfer of ink from a mylar ribbon. In all the years working with this technology, I never witnessed a Color Bar Code that was incorrectly scanned. That was quite a statement for those days. In subsequent years, I campaigned long and hard with many printer manufacturers to include on-board verification as they were printing other kinds of bar codes. With one or two exceptions, this plea fell on deaf ears. Until some of the major retailers like Wal-Mart, Home Depot and K-Mart imposed massive fines on suppliers who failed to produce accurate and scannable bar code labels, the need for verifiers seemed to be an extra burden and expense. How times have changed! The value of a quality label is now recognized by most.

A few years later, an attempt was made to find a Color Bar Code printer that was priced much more competitively for the retail non-food marketplace. It was then that I initially met Dick Dilling and subsequently, Dr. David Allais of Interface Mechanisms (now Intermec.) Dick was one of the nicest people I have ever met. The industry surely misses his presence. The impact printer technology that they produced in those days was one of the most prolific ways of printing bar codes. They were asked to make a proposal to NCR to build and OEM a CBC printer. At some point, a plan was submitted. The venture didn't advance very far as I am certain that NCR's stodgy OEM process was probably more than David could put up with. What I do remember is knowing and working with two greats of our industry. David and I have shared speaking engagements in the U.S., Japan and Europe and much has been learned from this association.

For several years, I was the only individual marketing CBC. From a personal perspective, I was one fortunate individual as this adventure took me to nearly every major city in the United States and Canada. And a few very remote locations as well! This technology provided the opportunity to truly explore this great land of ours to the hilt.

This was a challenging experience and one that set the stage for many future events in my career. Aside from the fact of trying to sell a $10,000 printer, there was the constant threat from other technologies. My memory is full of spirited battles. Print-punch tickets were big in those days. Magnetic tags were trying to make inroads. OCR was somewhat in the infancy stage but Sears, in particular, lunged head first into that technology and created a diversion that, at times, was difficult to overcome despite the deficiencies of OCR at that time. In the bar code arena, Codabar had already been launched with relative success. Each day and each customer presented new challenges and opportunities. It was fun and most gratifying when CBC was the winner with any given customer.

Competition was stiff and competition it was. Again, times have changed. The performance and quality of *competing* technologies have improved dramatically. New mousetraps like RFID have appeared. In today's market, one could say there are many *complimentary* technologies. In each case, the selection process should be driven by the application and there is a niche for all. Although my bias has always been with bar coding, even an old dog can recognize that newer technologies such as RFID will be playing an increasingly important role in the future.

But there was still another kind of competition. One of NCR's senior marketing vice presidents had not made the complete transition to electronics. He consistently traveled the country casting

a negative spin on Color Bar Code. How was this to be combated? I frequently called his secretary to obtain his travel schedule. Upon his departure from various locations, I would call and try to convince the local branch managers that they could not spend another day without being knowledgeable about CBC! It worked. Many sales pitches and seminars were given to both NCR and customer personnel. Numerous orders were received so success was achieved on a relative basis. Why relative? Simply because total success could not be accomplished until the industry adopted a single standard to be used by everyone.

In the early to mid 1970's, there were many different kinds of bar codes. Typically they were proprietary. Why so many? Manufacturers felt they could sell more of their own product with their special code. In theory this might have been true. In reality it failed. Until such time that companies put their codes in the public domain, mass implementation was not about to happen. The need for standardization was demonstrated by the adoption of the Universal Product Code (UPC) in 1973. Although it took time for complete implementation, both manufacturers and retailers alike were singing out of the same hymnbook. Non-food retailers had not reached this zenith in the mid 1970's because no single standard was prevalent.

Chapter IV - A Fork in the Road: Purchase Order Management

In late 1973, a slight career deviation took place. For the next 1½ years, I was asked to head a team to define a very sophisticated retail application called Purchase Order Management (POM.) In those days, it was one of the most complex programs ever undertaken in the retail industry. It was most fortunate that NCR management allowed the participation of three different department stores to be part of the definition team. I was rather adamant at the time as, in those days, too many software programs were developed in an "ivory tower." As a result, they frequently did not realistically address user requirements.

This fork in the road very much related to bar coding but in a different sense. The success of a POM application was heavily dependent upon the entry of accurate and timely data. Although bar coding was not ready to play a role at this time, it rapidly became apparent that a *systems approach* was absolutely required. We worked with actual users to define requirements. Once successfully completed, it then became even more obvious for the need to have automatic data entry.   Along with a prior background of helping to define a computerized automatic replenishment system, this exercise went a long way toward my ultimate systems orientation.

Helping to guide the way was Mike Mockbee who was, at that time, the EDP manager at McRae's in Jackson, Mississippi.   Other partners included Nordstrom's in Seattle and Thalhimers in Richmond, Virginia. It was Mike who was the real leader and inspiration. His thought process was far ahead of most department stores in that era. I learned much from Mike and I also gained the closest friend, confidant and advisor. What a winning combination. The entire experience would serve me well for more than 30 years. Both professionally and personally!

Chapter V - A Florida Adventure: Moving to the Industrial Side

It's amazing how destiny can change one's fate. In 1981, I was serving as Director of Retail Systems for NCR's European Division. One day, a good friend, Jack Householder, came into my office to announce his transfer to the Engineering & Manufacturing facility in Lake Mary, Florida as Director of Product Management. After describing his job responsibilities and the industry he was gong to be working with, I made a very innocent, flippant remark, "Jack, you need me there to help accomplish your mission!" A quick and positive response caught me by surprise. To make a long story short, a move to Florida took place in April 1982. This was not without a lot of "flack" from Herb Schene, Vice President of the European Division. He felt that golfing was the primary goal and wanted to keep me in Dayton. Although there was some truth to those feelings, the obstacle was overcome and my future was cast.

This move introduced me to an entirely new world. Up to this point in my career, all activity revolved around non-food retailing. Now, it was time to become exposed to the industrial world. As a Bar Code Product Manager, I rapidly became acquainted with the "rest" of the bar coding world. All of a sudden, there was a lot more than "Color Bar Code!"

Initially, an acquaintance was made with Chet Benoit, Bill Allyn and Andy Longacre of Welch Allyn. Together, we quickly developed an OEM program for their contact "wands." For scanning purposes in those days, it was the greatest product since sliced bread. Although very popular, functional and cost effective, it became very obvious even in those "early days" that wands were not the growth technology of the future.

Late in 1982, Chuck Furedy and Rich Bravman of Symbol Technologies made a sales call with their new LS 7000 handheld laser scanner. Talk about a kid on Christmas morning. I became so excited about this new product from a company that only did $2.9 million dollars in sales and had a negative bottom line of $1.7 million. Now they are a very profitable $1.5 billion dollar company. Talk about dynamic growth!

It was early in 1983 that I had my first conversation with Symbol's Jerry Swartz - a man that I deeply respect and admire. About 6:30 one evening a call was made to Rich Bravman and, much to my surprise, Jerry answered the phone. Rich was not there and nearly two hours later, the conversation concluded. Not only did I learn a lot, but Jerry's enthusiasm rubbed off on me forever. It's amazing how the little things in life can become so meaningful.

I'm a little off track so back to the LS 7000. This was the first one-pound handheld helium-neon laser scanner. Although a lot more expensive than a contact wand, it didn't take a crystal ball to predict the future of this technology. We all know the rest of that story. There is a favorite memory of that product. In this case, one of my jobs was to convince NCR's engineering management that laser technology was the way to fly. As part of the process, the features of the LS 7000 were proudly demonstrated. Symbol stated that the LS 7000 could be dropped onto a concrete floor from four feet (as memory serves) and it would not break. So after getting everyone excited, I proceeded to do the "drop test". If anyone can break something, I can. Need more be said? We overcame that experience but still were unable to OEM the product. Let's just say that "pride of authorship" and lack of vision intervened and let it go at that.

Chapter VI - The Ten Commandments of Bar Coding

It was in 1986 that I was providing consulting services to the Boeing Helicopter Division in Philadelphia. They were commencing the process of implementing a bar code-based system. They formed a team to accomplish this task and it was unique in the sense that it was headed by the General Manager of the business unit! In those days, many of the old timers will remember the discussion about implementing from the top down or the bottom up. I suspect we could reinvent that same discussion today!

In any case, it was rare for a GM to be involved. At one of the early team meetings, The GM asked if I could put together a presentation of "do's and don'ts" regarding the implementation of bar coding. This was an astute thought as most want to know what it will do as opposed to knowing the pitfalls *ahead of time*! Without thinking, a very rapid and positive response was given to his request. Upon departure, I asked myself what in the world had I committed to?

For the next few days, an attempt was made to formulate the presentation. Finally, I stumbled upon an idea. For a number of years, a tattered piece of paper occupied my shirt pocket on a daily basis. Everywhere I traveled to user sites, I wrote down problems encountered with the implementation of bar coding - particularly those that were redundant. The list had grown to substantial portions. Most importantly, they were real problems in the real world! Then the inspiration hit. They would become the basis for the report back to Boeing.

**Ten Commandments
of
Bar Coding**

1. Low Density
2. Wide to Narrow Ratio
3. Carbon Ink
4. Media Substrate & Adhesive Backing
5. Verification
6. Scanner Resolution & Media Density
7. Bar Code Height & Quiet Zones
8. Numbering Schemes
9. User Friendliness
10. Support Source

And so it went item by item. Once complete, it was realized that this epistle could be quite meaningful to any organization attempting the implementation of bar coding. A formal presentation was put together and titled *The Ten Commandments of Bar Coding*. Shortly thereafter, it was off to Philadelphia to embrace the team at Boeing. The positive reception served to spread the "gospel" far and wide. Although intended for the uninitiated, many who had already encountered implementation pitfalls stated that *The Ten Commandments* were sage advice for anyone - novices and experienced included.

Little did I realize at the time how long these teachings would live. Over time, they were presented several times every year at the Scan-Tech/Frontline Solutions and ID Expo conferences. It is estimated that more than 10,000 people have been the recipient of this lecture. It has been printed in publications in the United States, England, Japan, Australia, Italy, England, South Africa and perhaps others.

Chapter VII - A Learning Experience at the AIAG

While in Lake Mary, I began attending many conferences and seminars. This was the way to learn. In 1982, APICS held a tabletop conference and exhibit in Orlando. That same year, Scan-Tech held their first event in Dallas. It was at these sessions that I learned so much and met so many. I recall meeting Mike Noll of the Department of Defense (DoD) and Colonel Ed Gould of

the U.S. Air Force at the 1983 Scan-Tech in San Diego. Both had a significant influence on my future.

During my tenure in Lake Mary, I was working closely with Jerry Webb who was with the Data Pathing Division in Dayton, Ohio. Jerry encouraged me to become a committee member of the Automotive Industry Action Group (AIAG). With the blessing of my boss, Jack Householder, extensive time was spent with this organization for nearly four years. It was in Detroit that close acquaintances were made with people like Jack Loeffler of Ford, Tina Barkan of Symbol, Sprague Ackley of Intermec, Marty Hileman of Standard Register and many others. What an unbelievable learning experience! These people were so kind and patient while providing a relative novice with so much knowledge. I will be forever grateful.

Jack's solid influence and leadership catapulted the AIAG into a real success story and one that greatly influenced the entire industrial world. Sprague and Marty were in-depth knowledgeable about bar coding, great tutors and spirited the writing of meaningful standards. Tina not only provided substantial input to the AIAG but also later served as a friend and beneficial partner to Delta Services after I founded that company.

It was at the AIAG where I became more heavily involved as an educator. Serving on their education committee provided impetus to a whole new aspect of service to our industry. In those days, customers had to be educated first and then sold on bar coding. They had to be convinced that it was not only a viable technology, but also an important tool to provide timely and accurate data to a variety of computerized applications.

The AIAG experience was all about the establishment of industry standards.

Chapter VIII - 1982 to 1984: An Industry Turning Point

1982 was a very significant year in the development and use of bar coding. In January, the Department of Defense (DoD) released their MIL standard 1189 that incorporated the use of Code 39. Still another major milestone occurred that year when the very first Scan-Tech with tabletop displays was held in Dallas, Texas. I will never forget standing outside the exhibit hall waiting for the doors to open at 10:00am on that groundbreaking day. There was a lot of energy and curiosity about a technology that few knew anything about.

In 1984, after several years of hard work, the AIAG released their initial Code 39 standard. There was additional significance to this release. Most of the prior standards were known as "symbology" standards. The AIAG created some of the first "application" standards. It applied a symbology standard and stated how it was to be used. This created the framework for many subsequent application standards.

It is believed that the 1982-1984 era was the spark plug that ignited a multi-billion dollar industry. Food retailing was moving ahead at a good pace but that was about it except for some industrial "islands of automation" that utilized a wide variety of bar codes at various companies. The DoD and AIAG paved a common path for the industrial world from a user viewpoint. Publicly, both organizations would say that their suppliers should comply by marking products and cartons on a *voluntary* basis. However, in reality, their suppliers *had* to comply or risk not

doing business with these two giants! Scan-Tech helped pulled the industry together by providing focus.

Mammoth indoctrination and educational programs became critical as a result of the adaptation of these standards. Mike Noll of the DoD personally provided education to more than 20,000 people in a relatively short time. The AIAG education committee had the dynamic task of convincing automotive suppliers to comply by placing bar codes on parts and cartons. There was a frequent cry from automotive suppliers for more money to pay for the additional cost! That made sense until I heard the response from Jack Loeffler who, in my opinion, was the person that really made the AIAG effort successful. Keep in mind that those were embryonic times. Jack told all of those in resistance, "we will not pay for any additional costs and we will not ask to share in the profitability of your using this technology internally!" Those were pearls of wisdom but it did take a few years of convincing!

So from 1982-1984 on, many users no longer had to concern themselves over "what" bar code to use but "how, were and when." Code 39 became the industrial world's de facto standard. Even at that early time, it became evident that proprietary codes would not survive in any significant manner. Most manufacturers of bar code equipment banded together in the development and distribution of scanners and printers that would accommodate Code 39 and some of the other codes that became standards. Users now had a true choice of providers to satisfy the requirements of many applications.

However, there were other challenges. Bar code companies were naturally trying to sell their own "wares." As a result, many were pushing a "solution looking for a problem!" In those days, I felt like the lone ranger by taking a "systems" approach versus a "product" approach. There were times as a consultant that business was lost to companies who wanted to implement bar coding but did not have the computerized application software to support the technology. Until such time that they were ready to commit to the necessary programs to accept the input of timely and accurate data, it was futile to install bar code equipment so my recommendation was always to get their house in order first. Fortunately, the industry has evolved and today, most take a systems solution approach. This is a major reason why Value Added Resellers (VARS) and integrators have become so prolific.

Chapter IX - Authoring Books
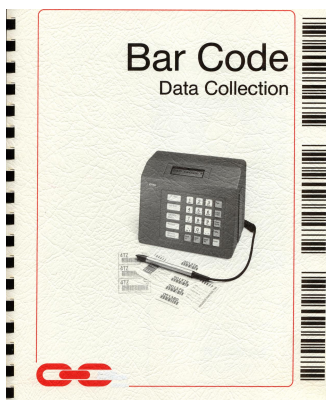
As mentioned before, upon moving to NCR's Engineering & Manufacturing facility in Florida, I had the task of seriously learning about a new industry (to me) and how bar coding would benefit. After a lot of education about the industrial world and the technologies available to meet that industry's need, I set out to create a manual. It became very voluminous and served many customers who were thirsting for knowledge about bar coding. What symbology? What printer? What scanner? What application? These and other questions were endless but the *Bar Code Data Collection* book did its' job.

A few years later, Rick Bushnell visited my office and asked me to consider co-authoring a book with him. At first blush, I was honored. Not realizing the scope of such a task, I heartily agreed. The timing was shortly after the founding of Delta Services and it was felt that a book would add credibility to both the company and myself. And so the task went on, and on, and on and on! Once this undertaking was completed, I vowed to never write another book! (I had not learned to "never say never!") The days were filled with changes, modifications and more changes. It was a lot of work. But, in the end, it was a worthy exercise for both of us in many ways. First, I overcame my fears about writing so that served as a springboard for even more of the same. Not books, but many, many articles. I will always be deeply grateful to Rick for the vision and opportunity.
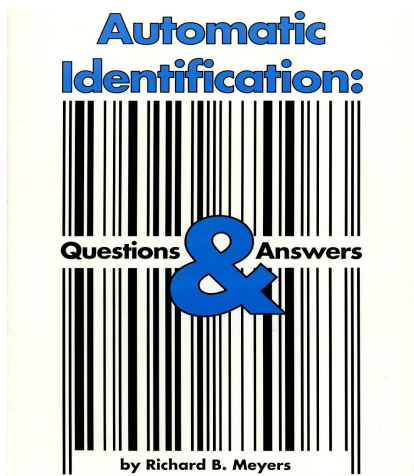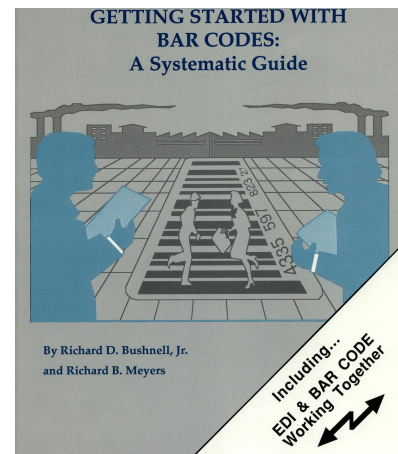
What followed was a request from Automatic I.D. News to author a monthly column called *Questions & Answers*. One more time I jumped in the water without ample testing. By this time the writing was flowing nicely. What was not realized was the inordinate amount of pressure of meeting publication deadlines! The first published Q&A article was in December 1988. The last column appeared in March 1994. Ultimately, Advanstar (the publisher) put it into book form. What I liked most, in addition to contributing to users of the technology, was the ability to use this column as a platform to address key controversial issues of the time. One very important issue was the conflict between Data Identifiers and Application Identifiers.

Chapter X - Data Identifier Dilemma

In 1988 an invitation was extended to become a charter member of the Federation of Automated Coding Technologies (FACT) standards organization that was chaired by Bob McQuade of Bellcore. The committee that I worked on had the mission to create a common standard for Data Identifiers (DI's) as a major extension of the work done at the AIAG. This group consisted of some of the most knowledgeable people in our industry including Craig Harmon, Rick Bushnell, Bert Moore, Tina Barkan and many others as well as Bob Fox whom I had met at Boeing. This entire project was richly gratifying in terms of learning along with the working experience itself. It was a classic case of multiple people from different organizations with a wide variety of interests harmonizing for the good of all. The resulting product ultimately became an ANSI and ISO standard. It has truly provided substantial benefit to many companies and organizations worldwide.

There were some significant challenges along the way. For example, some cried "foul" as the Uniform Code Council (UCC) refused multiple invitations to have representation on this committee. They elected to establish Application Identifiers (AI's) and to travel their own path.

It was felt by some that this posture would create considerable conflict and confusion on the part of the user community. And, for some time, it did. Thus a major dilemma.

However, the DI-AI conflict was not simply one organization versus another vying for leadership. It also became a major issue in another way within the walls of individual companies. An unnamed client was a good illustration. One of their divisions decided to implement bar coding from scratch. As part of the process and for many good reasons, they were urged to include the use of Data Identifiers. They did, but what followed was unbelievable. Another of this major corporation's divisions had also decided to use DI's. However, their definitions were entirely different. In that parts and products were interchanged throughout many of their divisions, a horrendous conflict was all but certain.

For more than one year, an effort was made to try to create a single DI standard for this company. Finally, the light turned on and it was agreed to hold a corporate-wide meeting with the goal of creating one standard. Ultimately the objective was achieved but not without great cost and further conflict. Privately I was told that it cost in excess of $100,000 to change to a level playing field! This was a classic case of "pride of authorship."

As a major champion of the cause, I authored numerous Data Identifier articles in both U.S. and European editions of *Automatic I.D. News*. In addition to explanations about how they worked, an attempt was made to cauterize the industry by pointing out serious concerns about the UCC going their own way versus joining FACT in a harmonious effort. Some support was rendered. The July 1988 edition of *Scan Newsletter* reported, "At present, it is not too clear as to why the UCC and EAN chose this somewhat controversial approach rather than going with the Data Identifiers, which everyone else seems to be running with." Ultimately, it all worked out but not without a lot of acrimony.

As a footnote while on the subject of standards, one individual stands out as a great donor to this industry. I've known and worked with Craig Harmon for more than 20 years and don't think any one person has added more glue and intelligence to the construction of worldwide standards in multiple technologies. He has been a ceaseless traveler, tireless worker and major contributor on a global scale. Many people and companies alike owe Craig much gratitude.

Chapter XI - Delta Services

On a fateful April day in 1988, it was announced that the charter for my business unit was canceled. After nearly 25 years of service with NCR, I no longer had a job! The initial thought was to hang up my own "flag" and start a business. But at my age, that was a bit scary. An alternative was to go back to Dayton, pound NCR's hallways and look for another job. One side of me said that was the only intelligent thing to do. Another side said that the effort to move to Florida was too great and this was NOT the time to go back north! Delta Services was founded!

Next came the challenge of making a living. Initially, it worked out fairly well. There were clients that I was already consulting with while at NCR. A number of them agreed to remunerate me for continuing services and that served as a base to get started. However, it didn't take long to realize that a major problem existed. While working and making money, I was not spending the required time performing the necessary marketing function. Of course, the reverse was also true. This was not a good combination.

A sudden thought transpired. In recent years, NCR had switched their sales strategy to one of concentrating on major accounts thus leveraging their sales force. On a small scale, why couldn't the same thing be done with Delta Services? Now the goal was to obtain one or more partners that could perform the marketing function while I provided the service. An early and unsuspecting opportunity turned up out of the blue. While returning from an AIAG meeting in Detroit, Tina Barkan of Symbol Technologies happened to be on the same plane to Cincinnati. Having plenty of connecting time for our next flights, we met for more than an hour and discussed education opportunities. Her boss, Sal Cali, fully supported the concept and a seminar series was developed. For a number of years, I was fortunate to be part of the team that designed and conducted numerous events throughout the country. Symbol did all of the marketing and they also bought the book that Rick Bushnell and I co-authored and distributed it to each of the participants. We had some great programs that were both fun for us and very beneficial for the attendees. Symbol obtained a lot of business and Delta Services was finally on the way!

Representatives from the U.S. Air force (USAF) attended one of these seminars in Dayton, Ohio. At lunch, Margarita Hernandez and Pete Ramirez stated the need for the USAF to have training programs. They had a lot of equipment installed at various bases throughout the world but there were few who understood bar coding much less how to use the equipment. At that time, their boss Jim Whitaker got very excited about the concept. But nothing happened. About a year later, I ran into Mike Noll of the DoD at the Atlanta airport and we shared a cab into town. I informed Mike of my frustration in that everyone was anxious to get started but nothing was happening. He made a phone call to Jim and the rest is history. We have conducted nearly 100 seminars and forums to more than 5,000 military and civilian personnel. Our travels have taken us from Germany to the Air Force Academy to Hawaii and many points in between.

Well, the rest is not quite history. Although Pete Ramirez has always been a big supporter, contributor and promoter of these activities, a hurdle appeared a few years ago when Mark Reboulet took over as the AIT-PMO program manager. Although he had an AIT background, as it was recalled, none of it was in the field of bar coding. His original thought of discontinuing the training series was changed after he attended one event. Mark became a believer and staunch supporter. Personally, I have great admiration for Mark as he is one of the best "listeners" I have ever known. This society really fails on that topic so he is very unique. He is also a motivator. Under his leadership, the training concept has advanced to specialize in given areas that are now harvesting many beneficial results for the USAF.

I would be remiss if I failed to mention the names of some of the people who made the USAF programs so successful. From the beginning, Rosie Gibler at Wright-Patterson has been and continues to be behind the scenes making major contributions. Don Ertel and John Helfrich of CDO Technologies have unselfishly labored with the shipment, setup and demonstration of equipment that has benefited so many. Ben Nelson of Markem not only was one of our prime speakers but also helped in any way possible with the logistics aspects of these programs. Also sharing the podium has been, Tina Barkan, Rita Neff and Bob Rylander of Symbol, Sprague Ackley of Intermec, Clive Hohberger of Zebra, Mike Noll of the DoD, TSGT Kerry Gietzel of the USAF, Rich Vossel of SAVI, Kevin Sharp of Accurate Information and Larry Shoup of Henry Ford Hospital. This has been an all-star lineup and a privilege to be part of this association.

Of course, numerous other activities kept Delta Services on the rise. Consulting services were provided to many Fortune 500 companies and to industry associations. In the early years, work continued with the AIAG and FACT. Of course, Scan-Tech and ID Expo were big events every year and *The Ten Commandments of Bar Coding* became one of the more popular presentation topics.

One of the more memorable (I didn't say best) Scan-Tech's took place in San Jose in 1989. The infamous 7.2 earthquake was a personal experience I don't ever want to have again! That night, there was a very serious relationship with a scotch bottle! It seemed in order after finding all of the furniture in my room knocked over on the floor.

When it hit at shortly after 5:00pm, I was on the 5th floor of the Holiday Inn along with Dennis Priddy of Data Matrix, Stu Crouse of the U.S. Army and a few others. After what seemed to be an endless amount of time (actually around 30 seconds), a quick flight down the steps to the lobby found pool water all over the floor. A little later that night, I thumbed a ride out to an airport motel where Rick Bushnell was scheduled to have a lavish party while celebrating the 10th anniversary of his company. No power! After a ten-floor hike up the steps, we had a good time but not too many people showed up.

Two things stick out in my mind from that never-to-be-forgotten evening. First, there was a terrible trapped feeling. Despite many efforts, there was absolutely nothing to be done. No rental cars were available. Nor seats on buses, trains or planes. Nothing to do but wait until a scheduled flight two days later. It probably would have been okay except the news was filled with the threat of many aftershocks - some which could be even more severe! Once I got out of California, I said I'd never go back to that place again. (I still had not learned to "never say never as many subsequent trips were made!") The other ironic twist was some people who were not at Scan-Tech (but had been scheduled) said they wished they had been there. NEVER will that thought process be understood. An earthquake is not something to experience.

Another fond remembrance is the cherished time spent with Nancy Kelly of Advanstar. Our first acquaintance was at ID Expo. Over the years, we worked together while trying to improve the quality of the conference side of ID Expo, ID Info, Scan-Tech and Frontline Solutions. Nancy was a great contributor to this industry and deserves some kind of special award for her tireless and enthusiastic efforts.

There are so many great stories over these past 15 years that Delta Services has been in existence. All can't be told, or remembered, but my appreciation can be expressed to everyone that has been so much a part of this success story.

Chapter XII - International Snippets

These memoirs would fail to be complete without relating a few of the many international experiences. In most cases, these trips were relatively short thus their chronicle will be in snippet form. At great risk of boring the readers of this journal, here they are:

South Africa
I'll start with my favorite country that I visited four times. This part of the world has the most hospitable people anywhere. Further, the geographic beauty is second to none, the food is great and the price is always right! Golf was played in Johannesburg, Pretoria, Cape Town, and at Sun City in Bophutaswana (where the Million Dollar Challenge is held every year.) Even an overnight safari into the bush was included and that was an adventure NEVER to be forgotten.

Jack Householder moved there so he and his wife Ferri were a wonderful part of my last two trips. We held seminars with organizations like SAPICS (the South African version of APICS). We were able to considerably influence the creation of bar code standards for the South African army! On one occasion, welcome partners were Chuck Furedy of Symbol Technologies and Ed Coe of Deloitte, Haskins and Sells. Quite a time was had including a stop at the Cape of Good Hope.

Europe
It was here that lasting friendships were made with people like Elisabeth and Paul Bergé and Ian Smith. I was proud to be a speaker at three Scan-Tech's in Basel, The Hague and Dusseldorf. Many NCR sponsored seminars were given throughout the continent and consults were made with a variety of customers. Trips were made to virtually every country in Europe but, in order to keep this portion reasonably short, only those special events or memories will be included.

England
England is a good place to start. Aside from Mexico and Canada, my first trip outside of the U.S. was to England, which was a stopover point en route to South Africa. Prior to departure, I had developed a completely uncalled for bias against England - for reasons not known to this day. However, since an entire day was virtually at my disposal in London, I was advised to go downtown, hire a "hack" and see the sites. What an unbelievable experience. It was replicated many times later with other newcomers. This is the ONLY way to see London if time is of the essence. The driver was so accommodating and informative. Well, my opinion of England and its' people immediately changed. Over the years, it got even better. Lacking the desire for big cities was a conflict, as London became an all-time favorite!

There were so many good and productive times here. Jack Loeffler of Ford joined us one time on a series of seminars with BPICS and the British Computer Society. Great personal and business experiences were had with Jack Poole who had been promoted to Retail Director for the UK. Colonel Gene King and I had a memorable day playing golf at The Belfry, site of many Ryder Cups.

And of course, there were the many historic site visits including Buckingham Palace, Parliament, Westminster Abbey, 10 Downing Street, Stratford-Upon-Avon, Tower of London, Harrods, and Windsor Castle along with countless other places in England.

Scotland

Scotland is so unique but not excluded from my fond memories. The great people with those funny accents (all in good jest!) Only two trips were made to this northern land and on both occasions there was time for golf. Twice at Glen Eagles and once at the historic Old Course in St. Andrews where I was like a kid on Christmas morn! The latter was with Bill Thompson of NCR and Tony May who was a manager at House of Fraser.

Denmark

While not as geographically stunning as the other Nordic countries, Denmark was, by far, my favorite. The hospitality of the Danes is second to none. Working with customer and NCR personnel was a distinct pleasure. There was much business satisfaction, particularly with Magasin du Nord. Numerous seminars were conducted in Copenhagen.

Ib Torbenson, Retail Manager of NCR Denmark, was another special person. In addition to successful business ventures, he was so kind as to extend an invitation to his home for a special summer celebration called "Sankt Hans" that is celebrated annually on the longest day of the year. Becoming part of local international customs is always a very unique experience.

Germany

Eleven trips were made to Germany primarily because NCR had a manufacturing facility in Augsburg. However, many important customers were based there, and as a result, virtually every major city was visited.

Special memories exist. The unbelievable on time trains! The no speed limit autobahns! Everyone should experience at least one Octoberfest! The beer! Speaking of beer, having a berlinerwizen was a shocker. Why? It is a combination of beer and strawberries! However, on a warm summer's day in the Alt Stadt of Dusseldorf, it made for a pleasant one-time experience. The Mosel wine valley region and Bernkastel-Kues plus a wine tasting experience in the home of producer Hans Keller. Or the visit to the two thousand year old city of Trier. Hannover Fair was an unbelievable happening. Never have I witnessed such a massive show.

Beer was the subject of a surprise. In those days, NCR was a big anti-alcohol company. The first time I had lunch in the Augsburg cafeteria, beer was an option. What a shocker! Surely John Patterson (founder of NCR) was turning over in his grave!

Finally, the visit to East Berlin was memorable and chilling. Going through Checkpoint Charlie into the eerie and quiet streets of the other side is indescribable. Standing on a viewing stand on the western side looking over the "wall" onto barbed wire and sub-machine guns makes one stop, think and count their blessings.

Italy

In Milan a very special relationship developed with Piero Toso and the "home cooked meal" along with the trips he arranged to Lake Como and Rome. What an awesome feeling while standing on the floor of the Coliseum or in the middle of St. Peters Square at the Vatican. And I thought pizza was an American thing. The Italians really now how to do fix and serve that dish!

France and Monte Carlo
There is only one France. With only two quick visits to Paris, there is not a lot to record except for the beautiful city, its buildings and the Palace of Versailles. Of course, an evening at Moulin Rouge was quite eventful.

Monte Carlo turned out to be a favorite. Just happened there almost by accident but it did serve as a basis for quite a business affair the following year with NCR chairman Bill Anderson. Quite picturesque and great food. Never will I get over watching people lose a hundred thousand dollars in a matter of minutes at the gaming tables! Out of my league!

Other European Locations
Digging deep enough, more stories could be told about Ireland, Spain, Belgium, Austria and Norway. We'll stop here.

Australia/New Zealand
Fortune was on my side to be able to visit this part of the world five times. In both 1988 and 1989 I was honored to be a speaker at Scan-Tech Australia. Work was done with major companies both in retail and the industrial sectors. In Sydney, I met a very talented Warren Castray who, along with his wife Denise, ultimately became good friends. Along with Jack Poole, we spent two great weeks together in Sydney, Melbourne, Adelaide and Perth. There were so many experiences "down under" that it would be difficult to address them all. I found the local comparisons between Sydney and Melbourne most interesting. Not so much from my viewpoint, but from the spirited competition between the "Aussies!" It's something like the Minneapolis-St. Paul syndrome here in the states. It was in Australia that I met and worked with Trevor Dean and David Kyle.

New Zealand is a special land. The people are absolutely wonderful. The South Island should NOT be missed by anyone traveling to this part of the world.

Hong Kong
Busy, busy, busy is the only way to describe this shopper's mecca. Aside from Japan, I never saw so many people in so little space. But they manage very well. On one trip there was time for a round of golf at the Royal Hong Kong Golf Club. From close proximity, one could see into Red China.

Singapore
Cleanest large city ever visited with the best taxis anywhere. In the annals of landmarks, the world-famous Raffles Hotel stands tall. Their famed Singapore Gin Sling was immensely enjoyed at their Long Bar. Oh yes, business was the purpose of the visit. The primary mission was a seminar sponsored by Integrated Advanced Controls. After returning home, a very computer literate co-worker insisted that one-hour could not be spent talking about bar coding. In reality, two full days were spent on the topic and all was not covered! There is no question that there is much to be known by the uninitiated and especially for those who are to be involved with the implementation process.

Philippines
One visit to this multi-island nation included a seminar and a round of golf at Wack Wack Golf and Country Club that is a World Cup venue. Up to this time, fish was not a favorite food so, when lunch was served, I asked for something else. (One did not have a palate for fish while being raised

in Dayton, Ohio!) Out came what looked like fried chicken. It turned out to be one of the best pieces of fish I ever consumed. A lesson was learned and fish has turned out to be a favorite.

Japan
Several trips to Japan were most eventful. First, it is another country that has too many people and too little land. On the other hand, quite historic. This is where I learned to carry a matchbook cover from my hotel. The Tokyo Hilton was not that far from the NCR office and after being chauffeured back and forth for two days, I said that a walk to the office the next morning would be good for me. Upon departure, I zigged instead of zagging and before long, I was as lost as one could get. Everything looked the same. A taxi was flagged down but the driver did not understand one word of English. No way to get back to the Hilton. Fortunately, I remembered that the NCR building had a very large company logo on the top floor. After a few minutes of frustration, I gave the driver one of my business cards that contained a big red and white logo. The destination was finally achieved but not without a lot of worry to my hosts.

There was another fish story. Prior to the first trip, I politely asked Nobe Morita if fish could be avoided - at all costs! (Fish had not as yet arrived as my food of choice - especially as a result of what I had heard about in Japan. Okay, so I'm a coward!) Nobe took care of everything and there was no problem except on the last night in Tokyo. Bob Muirhead, NCR's Managing Director, took me to dinner and insisted on eating all the undesirable things. Thank goodness for all of the accompanying sauces. We survived!

There were other memorable happenings in Japan. The bullet train is fascinating and all is as advertised. En route to Osaka, a stop was made at the Kinkaku-Ji temple in Kyoto. There is no way to imagine a more serene place on earth. A Japanese temple is a MUST visitor destination.

While giving a seminar in Osaka, I thought all was going so well as everyone kept saying ah so! Little did I know that they did not understand anything! They were merely displaying politeness. Thus the need for a translator. That was still another unique experience and one that must be learned.

On the second trip, I was proud to share the podium with Dave Allais at Japan's first Scan-Tech. Also on that excursion, stirring feelings occurred while visiting the Imperial Palace.

Chile and Argentina
I've heard about remote locations before but the Chilean city of Los Angeles was out of site! Jack Householder and I flew from Santiago to Concepcion and then drove to a paper mill nearly a hundred miles deep into the jungle. Talk about being away from civilization! This is a poor country with very nice people.

En route home a quick stop was made in Buenos Aires, which is a grand city. In one sense, it reminded me of Washington, D.C. or Paris as all three have magnificent architecture. This was mostly a pleasure trip that included a visit to the nightclub where the tango originated and included a wonderful dinner consisting of the famous Argentine beef.

Brazil

Rio is without question the most beautiful city on earth from a geographic viewpoint. The statue of Corcovado and the beaches at Ipanema and Copacabana are all that you may have heard about and then some. I renewed an acquaintance with Fred Angelis with whom I had worked with in Miami. Later, we paired up again on a personal basis when he moved to the Orlando area.

Canada

Finally, a brief snippet about our northern neighbors. This country has many special memories. Every major city has been visited and some like Toronto and Montreal many times. It was outside of Toronto where I had my initial exposure to a hypermarket. Hypermarche was the first of its kind in North America and also the site of the first Color Bar Code installation outside the United States! What a learning and joyful experience that was! It was many years later before the U.S. became exposed to this kind of retailing.

Canadian visits 25-30 years ago were unique with endless experiences. Friends and co-workers like Peter Nind, Heidi Nichols and Catherine Black are just some of the ones I am able to remember and enjoy.

Chapter XIII - The Zenith: AIDC 100

Given enough time, even a blind squirrel will find an acorn. Over the years, some recognition has been granted including the Outstanding Achievement Award from the AIAG. Another to be proud of was becoming an Honorary Teammate in Union Carbide's Auto ID Skill Center for service above and beyond the call of duty.

My zenith was achieved through induction by peers as a charter member of AIDC 100 (Automatic Identification and Data Capture) on May 17, 1997. This honor will be cherished ad infinitum. By late 2003, only 116 members have been inducted into this prestigious organization. This is out of tens of thousands who have put forth considerable effort to grow the automatic identification industry. It has been an honor and privilege to serve as Chairman of the Leadership Council and also as Chairman of the Membership Committee.

AIDC 100 is a non-profit, self-sustaining, non-political association of automatic identification and data capture professionals and others who have significantly contributed to the growth and advancement of the industry. The organization is a technical and business resource with emphasis on education. The primary goal is to enlarge the business community's knowledge and understanding of AIDC. More information on AIDC and its members can be found at:

http://www.aidc100.org/

The mission of the AIDC 100 Archive at Stony Brook University Library is to identify, acquire, arrange, describe, preserve and make available to the public, industry members, educators, students and media a comprehensive record which shall document the invention, development and current state of the AIDC industry, and serve as a central, permanent repository for all important documentation on the AIDC industry.
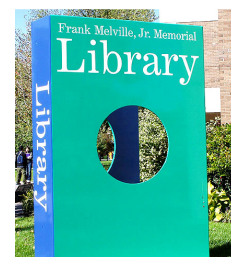
On October 2-3, 2003, AIDC 100 held a very successful meeting at Stony Brook University. A magnificent time was had and a foundation for future growth and accomplishment was established. It is wished that the entire membership could have been present. Unfortunately, that was not the case. But those that were in attendance are pictured below.

Dave Allais	Dave Collins	Ed Barkan	Fran Beck		Bruce Wray	Paul Bergé	George Wright	Larry Roberts	Mark Reboulet	Bill Hakanson	Dick Sawyer
Mike Ohanian		Peter Hicks	Jim Fales	Chuck Mara		Frank Goodfinger		Mark David	Andy Longacre	Allan Gilligan	Kristen Nyitray	Lois Mazer
		Benny Tafoya		John Hill		Karen Longe	George & Teddy Goldberg		Gabriele Edgell		Dick Meyers	Al Wurz

Let's digress for a moment. As a footnote and on behalf of the entire membership, acknowledgement is due George Goldberg. As one of the "founding fathers," it has been through his vision, inspiration and leadership that this organization has prospered. We are all in debt to George for his extraordinary efforts. Thank you.

The automatic identification industry has been and will continue to have a positive worldwide impact on the lives of individuals and on corporate productivity. While at our last meeting, Mark Reboulet suggested that members write their memoirs so as to truly capture the events of this industry's history. It is hoped that these memoirs will serve as a catalyst for others to do the same so that history can be preserved for one and all to enjoy.

Chapter XIV - Epilogue

As we turn the corner toward 2004, I am deeply grateful for the many people who have crossed my path. Ones who have had significant impact on my activities and those who have greatly influenced my growth in this industry. Much thought was given about mentioning specific names in these memoirs at the risk of missing very important ones that have left a positive

influence. Thirty-five years is a long time! It was decided to name the ones that this failing memory can recall. For those that have been missed, I humbly ask for your forgiveness as my gratitude also reaches out to you. To one and all, I am sincerely in debt for all that you have done.

When NCR was a world leader, manufacturer and supplier of cash registers, accounting equipment and computers, there were many buildings on their campus in Dayton, Ohio. On one, there was an inscription, "We are part of all we have met."

And so to an industry that I have served for a very long time, I thank you and conclude by saying you are all a part of me. I've done so much, gone to so many worldly places and have met and worked with so many wonderful people. How could anyone be more fortunate? I will always be deeply grateful to the automatic identification industry for these rewards.

Chapter XV - Special Kudos

Sprague Ackley: An incredibly brilliant technician who provided much patience while teaching me so much about the technology.

Tina Barkan: For her knowledge that was transferred to me, for her aid in forming a strong business relationship and for her friendship.

Paul Bergé: Along with Elisabeth, true friends, confidents and supporters.

Udo Birk: Introduced me to the "real" world of international customs - both business and personal.

Dan Brower: For insisting on my being part of one of the most significant releases in the history of NCR. This act launched a speaking and writing career and really thrust me into the world of bar coding.

Harry Burke: A great mind and stimulant.

Rick Bushnell: Opened an opportunistic door for authoring books.

Mark David: Doug and Mark made their publication available for the writing of
Doug Edgell: many articles.

Don Ertel: Faithful, dependable and an exceptionally hard working person who made life easy during many U.S. Air Force seminars and forums.

Rex Fleet: A most professional and kind person plus a major influence on my decision to move to NCR International.

Bob Fox: A strong ally who helped stabilize Delta Services in its infancy stage.

Rosie Gibler: Has been so contributory, patient and cooperative through many challenging times.

George Goldberg: For being a person to "look up to and respect" in addition to his constant support and superb guidance.

Margarita Hernandez: For having the vision of a need.

Martin Hileman: Another incredibly brilliant technician who provided much fortitude while teaching me so much about the technology.

Jack Householder: A friend who paved the way for a move to Florida while at NCR. This ultimately resulted in the establishment of my own business.

Mike Mockbee: Served as an incredible business partner but, more importantly, became my closest friend and advisor.

Ben Nelson: Always a friend and a quiet but most influential collaborator while conducting and supporting a multitude of seminars.

Mike Noll: Greatly influenced the start of USAF training programs with Delta Services.

Jack Poole: Persuaded me to move to NCR International. Without question, one of the best and most influential decisions of my life.

Peter Ramirez: Pete and Mark provided their backing in the development of one of the
Mark Reboulet: longest lasting training programs in the history of this industry.

Frank Rose: For his long and lasting support.

Len Solganik: For his ability to teach, challenge and encourage. A real stimulant who helped mold my future.

Al Tasker: Permitted me to grow and do "my thing!"

Ron Thie: A great friend who allowed me to be myself while supporting my enthusiasm and aggressiveness.

Jerry Webb: For being a friend "in need."

Appendix - Some Early and Historic Industry Milestones:

1949: First Bar Code patent was issued to Bernard Silver and M.J. Woodland. This was the "Bull's Eye Code."
1961: Sylvania General installed the first bar code scanner on the Boston & Maine railroad. The scanner read red, white, blue and black bars.
1967: Kroger in Cincinnati installed the first retail scanning system.
1968: Dave Collins founded Computer Identics, the first bar code only company.
1969: General Motors installed a $10,000 fixed-position helium-neon laser scanner.
1971: Al Wurz bought Magnavox's General Atronics division. It was renamed Accu-Sort.
1971: Monarch Marking Systems developed Codabar.
1971: AIM was founded with four companies.
1971: NCR released Color Bar Code.
1972: Dr. David Allais of Intermec developed Interleaved 2 of 5.
1973: The Universal Product Code (UPC) standard was announced.
1974: NCR installed the first UPC scanning system at Marsh's Supermarket in Troy, Ohio. A pack of Wrigley's gum was the first item scanned.
1974: Dr. David Allais and Ray Stevens of Intermec developed Code 39 (initially Code 3 of 9).
1976: The National Retail Merchant's Association (NRMA) chose OCR as a standard. It took ten more years before they switched to UPC.
1977: George Goldberg publishes the first issue of *Scan* newsletter.
1980: Sato introduced the first thermal transfer printer.
1980: RFID is invented.
1981: The first issue of *Bar Code News* is published.
1981: Norand releases the first CCD scanner.
1981: Code 128 is introduced by Computer Identics.
1982: The DoD releases MIL STD 1189 utilizing Code 39.
1982: Symbol Technologies releases the first truly successful handheld laser scanner.
1982: The inaugural Scan-Tech is held in Dallas with tabletop displays.
1983: ANSI releases the first three national standards: Code 39, Codabar and Interleaved 2 of 5.
1984: Automotive Industry Action Group (AIAG) bar code standards that utilize Code 39.
1985: The first issue of *Automatic ID News* is published.
1985: The Federation of Automated Coding Technologies (FACT) is formulated.
1986: The first ID Expo is held in San Francisco.
1987: Dr. James Fales opens The Center for Automatic Identification at Ohio University.
1988: Delta Services is founded.
1989: FACT approves the initial Data Identifier standard.
1990: Symbol Technologies announces a two-dimensional code called PDF 417.

Obviously, there are many other milestones over the past 50 plus years. The aforementioned are just a few of the key events that took place in the earlier era of automatic identification.