The History of the Check and Standardization Efforts

Early History

Bank checks first came into use in the late 1600s in England. Goldsmiths stored gold and silver for customers in exchange for credits or *Goldsmiths notes* (also called a *bill of exchange or draft*). The customers could write an order to the Goldsmith to pay back a certain sum to the customer or to another person or the bearer of the note. Checks evolved from these *bills of exchange*. The derivation of the word 'check' is disputed, but it is reported that the placing of a serial number to a *bill of exchange or commercial paper* as a means of verification allowed the *bill of exchange* to perform as a check does today.

Following the 1849 California gold rush the Wells Fargo Stage Coach Line specialized in shipping gold and silver from western mines to points east and being subject to stage coach robberies eventually worked out correspondent relationships with eastern banks so that clearings of payments using drafts or checks eliminated the physical movement of large amounts of gold. Consequently, Wells Fargo & Company also became a California state chartered bank.

With states only chartering banks and banks issuing currency backed by their own limited gold reserves, many banks failed as a result of depleted reserves when depositors made a run on the bank.

By the year 1913, the United States had 48 states and the check had become an accepted form of payment. But as the volume of checks grew, it took sometimes weeks for a check deposited at a bank on one coast to be paid. That year the Federal Reserve Act established 12 Federal Reserve Bank Districts and their branches as check clearing and collecting centers for banks that were members of the Federal Reserve system. The Fed member banks kept their reserves with their district Fed which could pool them and extend credit to member banks under certain conditions. As a result, the clearing of checks with the nationwide Federal Reserve Bank clearing system went a long way towards shortening the clearing times and reducing excessive exchange charges for checks.

By 1952, there were 47 million checking accounts with 8 billion checks written annually. The average check passed through 2.3 banks and required 2.3 business days in the process of being presented and collected. Therefore, on an average business day, there were 69 million checks in process throughout the payments system.

This paper was manually handled and sorted based on the bank routing number in fraction form printed in the upper right hand area of the check and the sheer volume of paper was threatening to bring the banking system to its knees. In April 1954, the *Bank Management Commission* of the American Bankers Association formed a *Technical Committee on Mechanization of Check Handling* to study the problem and recommend

a common machine language for the possible automation of the paper based payments system. This committee had their first meeting in May of 1954.

Possible Automation Solutions

The Technical Committee began working with various machine manufacturers and over a period of 2 years studied carrier systems with the data encoded on a surface attached to or wrapped around the check, and non-carrier systems consisting of codes or patterns and Arabic characters readable by machine or by the human eye. They reviewed magnetic ink binary or bar codes with miniature bar codes on the reverse side of the check, fluorescent spot codes, and Arabic character systems, some using conventional printer's ink and others using magnetic inks.

In July 1956, the Technical Committee published Document 138, *Magnetic Ink Character Recognition: The Common Machine Language for Check Handling* where the committee recommended magnetic ink character recognition (MICR) based on the advantages of having a machine readable language which is also easily readable by humans; on the relative insensitivity of the magnetic ink signals to mutilation by most overstamping, endorsing and writing instruments; and on a demonstration of the feasibility of this approach. Following this, all the major machine manufacturers involved, representatives of the printing industry, and the Federal Reserve System unanimously indicated their concurrence of MICR as the common machine language for mechanized check handling.

Of note, during the first OEM Committee meeting, in September 1956, Dr. Kenneth R. Eldredge of the Stanford Research Institute presented his work on magnetic character recognition on behalf of the General Electric Co. Dr. Eldredge filed for a patent *on Automatic Reading System* on May 6, 1955 and was granted U.S. Patent 3,000,000 on September 12, 1961. The U.S. Patent Office was reported to have held the number 3,000,000 to be assigned to a significant invention. Indeed, MICR as applied to banking automation, in retrospect, was truly significant. Stanford Research Institute, Bank of America, and GE because of their early state of the art work in magnetic ink recognition were heavily involved in submitting and evaluating many of the fonts which were submitted to the *Type Design Committee.*

Attention was then placed on determining the actual location and format of the fields of the common machine language. The location of the code considered were areas adjacent and parallel to either the top or bottom edge of a check. The preference, ultimately reached by most machine manufacturers was for the bottom edge. Reasons advanced in favor of the bottom edge were fewer mutilations, economy in equipment and operation, and greater customer acceptance. The one reason advanced in favor of the top edge was the apparent difficulty of adapting bottom edge encoding to punch card checks which were in common use. Compatibility with the 80 column punch card was reached with recognition that only the left most 50 columns could utilize the 9's punched hole positions as long as the pre-printed MICR information was positioned

parallel and adjacent to the bottom edge of the punch card. Post printing or encoding for these checks would be at the same location designated for all other types of checks. The *Technical Committee on Mechanization of Check Handling* published in Document 141, their recommendations on *Placement for the Common Machine Language on Checks* in April 1957.

The committee then met 3 times in September 1957 and 3 times in December to continue to study the problems of format for the various magnetic ink printed fields on the check. In January 1958, the ABA Technical Committee released publication 142, *Location and Arrangement of Magnetic Ink Characters for the Common Machine Language on Checks* where the report covered the fields on items to be encoded, the number of digits allotted to each, and the sequence of the information.

Publication 146, released in July 1958, entitled *A Progress Report: Mechanization of Check Handling*, specified the clear printing areas on the check and announced the field evaluation test for the E-13A type font. Some 50 printers were involved in a trial printing of the font. The Type Design Committee engaged Batelle Memorial Institute to administer the details of the trial printing and machine readability of the font. The Institute acted as a clearing house for instructions and to receive unidentified printing batches and forward them to the 5 machine companies for evaluation. The readability results were compiled by Battelle and presented in a report. Finally, in November 1958, the Type Design Committee agreed on a change in the Transit symbol and a relaxation of the void specification.

Many often wonder what does the designation E-13B stand for? E is the 5th letter of the alphabet which signifies 5 numerical type fonts or styles of type that were studied starting with the letter A. The 13 means the 0.013 inch grid that constitutes the matrix of the font. Each character has segments which are multiples of the 0.013 inch grid. The B stands for a modification of the 5th type font. In this case, with the E-13A font, a problem was noted as the transit symbol was sometimes misread as a character 8. Subsequently, the transit symbol was changed to what we have today and the type font was then designated as E-13B.

The Orange Book Standard Publication 147

Concurrently with the font development, the problem of format was resolved, and the Bank Management Commission of the American Bankers Association published Document 147 in April 1959, *The Common Machine Language for Mechanized Check Handling: Final Specifications and Guides to Implement the Program*. The Bank Management Commission of ABA since the publication of Document 147 released Publication 149 in December 1959 which relaxed additional tolerances and provided clarification of others. These changes were incorporated into 147R which was released in February 1962. Publication 147R was revised two more times with the release of Publication 147R3 in 1967.

American National Standards and ISO Standards

The *Standards Committee on Computers and Information Processing*, X3, with the Business Equipment Manufacturers Association as Secretariat, recognized the desirability of issuing the E-13B work as an American National Standard. It formed the X3-7 Subcommittee on MICR and with the assistance of the X3-7-1 technical group issued 2 related standards on MICR in 1963 as ANSI X3.2-1963, *American National Standard: Print Specifications for Magnetic Character Ink Character Recognition* and ANSI X3.3-1963, *American National Standard: Bank Check Specifications for Magnetic Ink Character Recognition*. Much of the information presented in those first Standards were taken from Publication 147. Meanwhile, the X3 committee kept X3-7 active and endorsed X3-7's participation in the International Organization for Standardization, Technical Committee 97, Subcommittee 3 (ISO/TC 97/SC3) on Character Recognition. After a series of international meetings which terminated in 1965, the ISO Recommendation R 1004-1969, *Print Specification for Magnetic Character Recognition*, was published. This recommendation contained the E-13B specifications in addition to another MICR character set known internationally as CMC-7.

By 1968, the American Bankers Association deferred the publication of 147R3 and future revisions to the American National Institute and both Standards X3.2 and X3.3 were revised again in 1970 and re-affirmed in 1976. In 1982, X3 assigned responsibility for the maintenance of X3.2-1970 and X3.3-1970 to its Subcommittee X3A1, Character Recognition. In 1983, X3A1 enlisted the assistance of American National Standards Committee, Financial Services - X9, and its Subcommittee, X9B (Paper Based Transactions), in order that a detailed review of X3.2-1970 and X3.3-1970 could be accomplished with input from all interested groups. In 1983, X3 approved transfer of X3.3 to X9 with the publication of X9.13-1983, *American National Standard Specifications for Placement and Location of MICR Printing*. In 1987, X3 approved the transfer of X3.2 to X9 and the revision of that publication became X9.27-1988, *American National Standard for Magnetic Ink Character Recognition*.

Meanwhile the ASC X9 Subcommittee, X9B, was growing because of a renewed interest in checks. Those who forecast the demise of checks in the 1980's as being replaced by electronic funds transfer were proven wrong as check volume continued to climb throughout the 1980's at 5-8% compounded annual growth rate. Membership in X9B has continually increased as the following standards were developed:

Specifications for Check Endorsements, X9.3
Bank Check Background and Convenience Amount Field, X9.7
Paper Specifications for Checks, X9.18
X9 Technical Guideline for Understanding and Designing Checks, X9/TG-2
Check Carrier Envelope Specification, X9.29
Legibility Specifications for Endorsements, X9.36
Extension Strip Specification, X9.40
X9 Technical Guideline: Quality Control of MICR Documents, X9/TG-6

The Future of the Check

A new era emerges in 1995 as imaging of check documents is vastly growing within financial institutions to improve customer service, automate proof-of-deposit functions, enable image reconciliation of in-clearings and provide image statements. Financial institutions are presently seeking to reduce transportation costs of paper documents and improve the speed of return of unpaid items with the introduction in 1995 of ANSI X9.46, *American National Standard for Financial Image Interchange: Architecture, Overview, and System Design Specification* which would permit electronic check presentment with image send or subsequent image store/forward systems and image query and retrieval on demand. Also in 1995, there are other new specifications/technical guidelines or revisions of existing specifications that are under development because of the special needs for improving the quality of check images and providing for the security of the paper document before it's imaged and subsequently truncated.

Let it never be said that the check is an old-fashioned payment instrument that will fade away because it did not respond to the need for change.

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