

# American National Standard for Financial Services

## X9.100-171-2005

Formerly Published as DSTU X9.85- 2002

# Specifications for Automated Identification of Security Features

**Secretariat**

**Accredited Standards Committee X9, Inc.**

**Approved: March 31, 2005**

**American National Standards Institute**

## Foreword

Approval of an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward their resolution.

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Published by

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## Introduction

Business practice in the US Payments System has changed with the introduction of computer-based technologies. The conversion of checks into electronic based transactions has reduced costs and improved efficiency. Trillions of dollars in funds and securities are transferred daily by telephone, wire services, and other electronic communication mechanisms. The high value or sheer volume of such transactions within an open environment exposes the financial community and its customers to potentially severe risks from accidental or deliberate alteration, substitution or destruction of data. This risk is compounded by interconnected networks, and the increased number and sophistication of malicious adversaries.

Some of the conventional “due care” controls used with paper-based transactions are unavailable in electronic transactions. Examples of such controls are safety paper which protects integrity, and hand-written signatures or embossed seals which indicate the intent of the originator to be legally bound. In an electronic-based environment, controls must be in place that provides the same degree of assurance and certainty as in a paper environment. The financial community is responding to these needs.

This Standard, ANS X9.100-171, Specifications for Automated Identification of Security Features, provides a means of identifying registered security features present on an original check.

While the techniques specified in this Standard are designed to reduce check fraud, the Standard does not guarantee that a particular implementation will meet the requirement of the Standard. It is the responsibility of the financial institution to put an overall process in place with the necessary controls to ensure that the process is securely implemented. Furthermore, the controls should include the application of appropriate audit tests in order to verify compliance with this Standard.

Suggestions for the improvement or revision of this Standard are welcome. They should be sent to the Accredited Standards Committee X9, Inc., PO Box 4035, Annapolis, Maryland 21403 USA.

NOTE - The user's attention is called to the possibility that compliance with this Standard may require use of an invention covered by patent rights.



## ANS X9.100-171-2005

When this Standard is processed and approved for submittal to ANSI by the Accredited Standards Committee on Financial Services, X9, committee approval of the Standard does not necessarily imply that all the committee members voted for its approval.

The X9 committee had the following members:

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## ANS X9.100-171-2005

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The X9B Specifications for Identification of Security Feature Standards group which developed this standard had the following members:

David Hunt, Chairman, BancTec Inc.

Peter Hanna, Secretary, RDM Corporation

A special note of appreciation is extended to Mr. Barney Barnes of MARS Electronics International for providing significant contributions to this work item while serving as the previous chairman. A note of appreciation is also extended to Mrs. Rebecca Webb of Create-A-Check for her service on the workgroup.

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# American National Standard for Financial Services - Specifications for Automated Identification of Security Features

## 1 Scope

This Standard defines a structure to properly identify security features using automation. The Standard enables the incorporation of standard and proprietary security features into the original check by providing a trigger and identification structure. The Standard provides a means of registering security features for use within this Standard, however it does not specify the aspects of security features.

## 2 Conformance/Purpose

The Standard's trigger and identification structure ensures the security feature can be implemented and used from the point of check creation through acceptance and processing. Automated identification of security features of checks can take place on a wide scale only with the incorporation of standards. Implementation of the Standard is voluntary, but through full implementation by a financial institution, some risks associated with check fraud may be reduced. Financial institutions, retailers and account holders, may realize greater fraud prevention potential by utilizing this Standard.

This Standard takes advantage of many techniques currently in place for automated data capture. Use of image capture, optical character recognition and magnetic character recognition are three examples of current technology that the financial institution will benefit from when implementing this new Standard.

## 3 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Accredited Standards Committee X9 (ASC X9) maintains a register of currently valid financial industry standards.

ANS X9.7-1999 (ANS X9.100-110) *Bank Check Background and Convenience Amount Field Specifications*

ANS X9.27-2000 (ANS X9.100-20) *Print and Test Specifications for Magnetic Ink Printing (MICR)*

ANS X9.100-160-1&2-2004 (ANS X9.13) *Specifications for Placement & Location of Magnetic Ink Printing (MICR)*

The referenced standards can be obtained through the following web address.

[http://webstore.ansi.org/ansidocstore/dept.asp?dept\\_id=80](http://webstore.ansi.org/ansidocstore/dept.asp?dept_id=80)

## **4 Terms and Definitions**

For the purposes of this document, the following terms and definitions apply.

### **4.1**

#### **aligning edge (ANS X9.100-160-1/X9.13)**

The bottom edge of a document when its face is viewed.

### **4.2**

#### **background reflectance (ANS X9.7/X9.100-110)**

A calculation of background reflectance on a check in the convenience amount and optical MICR clear band. All pixels are averaged in the minimum area 0.125-inch x 0.125-inch.

### **4.3**

#### **bar half-bar print zone (ANS X9.100-171/X9.85)**

A horizontal band, 0.50 inch high, on the front of the document, measured from the top of the MICR clear band, that stretches from the leading edge to the trailing edge of the document.

### **4.4**

#### **barcode clear band (ANS X9.100-171/X9.85)**

See clear band (barcode)

### **4.5**

#### **clear band (barcode) (ANS X9.100-171/X9.85)**

A zone surrounding the bar half-bar barcode that is 0.100 inches wide.

### **4.6**

#### **clear band (MICR) (ANS X9.27/X9.100-20)**

A horizontal band, 0.625 inch high, on the front and back of the document, measured from the aligning edge, that must be free of any magnetic ink other than that of the E-13B font.

### **4.7**

#### **external processing code (EPC) (ANS X9.100-160-1/X9.13)**

A MICR digit that conveys special information regarding the correct handling or routing of a check or check data to financial institutions and other processors.

### **4.8**

#### **external processing code field (EPC Field) (ANS X9.100-160-1/X9.13)**

An optional, single digit field located to the left of the routing field on a check. The EPC field is used for special purposes as authorized by ASC X9.

### **4.9**

#### **leading edge (ANS X9.100-160-1/X9.13)**

The right edge of a document when its face is viewed.

### **4.10**

#### **magnetic ink character recognition (MICR) (ANS X9.27/X9.100-20)**

The common machine language specification for the paper-based payment transfer system. It consists of magnetic ink printed characters of a special design, called the E-13B font that can be recognized by high-speed magnetic recognition equipment.



**4.11****MICR clear band (ANS X9.27/X9.100-20)**

See clear band (MICR)

**4.12****pointer (ANS X9.100-171/X9.85)**

A bar half-bar barcode for identifying security features present on a check.

**4.13****print contrast signal (PCS) (ANS X9.7/X9.100-110)**

The ratio of the print contrast of a specific printed point to the reflectance of its surrounding background.

**4.14****registered security feature (RSF) (ANS X9.100-171/X9.85)**

A security feature or group of security features on a check which is registered with X9 and assigned a unique binary identifier.


**4.15****trailing edge (ANS X9.100-160-1/X9.13)**

The left edge of a document when its face is viewed.

**4.16****trigger (ANS X9.100-171/X9.85)**

A designated MICR character in the EPC field used for alerting processing equipment that a registered security feature(s) is present.

**5 Trigger**

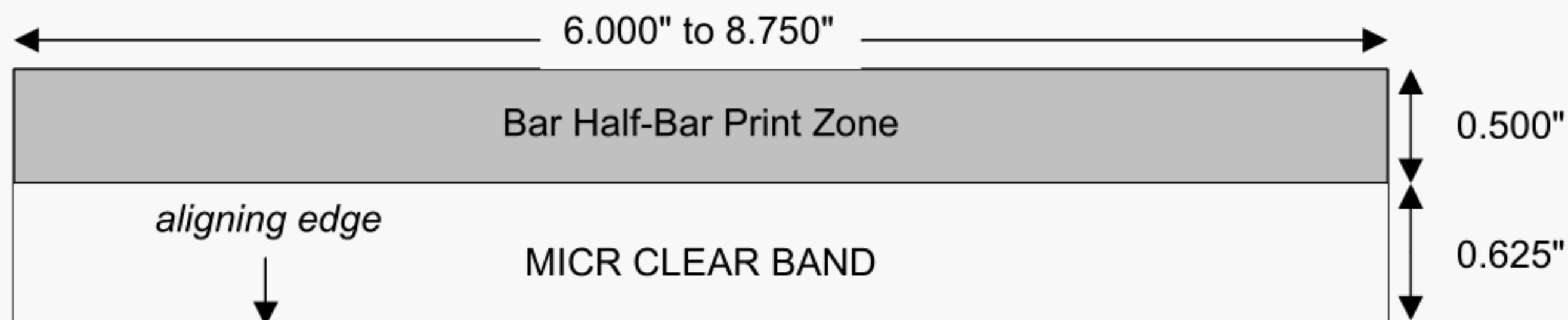
The trigger shall be a MICR character  in the EPC field and its use is to identify that a Registered Security Feature (RSF) is present. Refer to ANS X9.100-160 for proper placement of a MICR character in the EPC field.

**6 Pointer****6.1 Pointer Identification**

The pointer shall be a twelve-bit Bar Half-Bar barcode. The full bar shall indicate the binary one and the half bar shall indicate the binary zero. The barcode shall be bracketed by four bars, two on each end, and the height of this bar shall be 1.5 times the height of the full bar. The barcode identifies different security features and combinations of security features. The barcode shall be in a specified region of a check as per paragraph 6.2.1 (see Figures 1, 2 and 3).

**6.2 Bar Half-Bar Print Location Requirements****6.2.1 Print Location**



The printed Bar Half-Bar barcode shall be wholly contained within a 0.500 inch zone that stretches from the leading edge of the document to the trailing edge. The bottom edge of the zone shall be 0.625 inches from the aligning edge of the document and the top edge shall be 1.125 inches from the aligning edge. The print zone requirements are shown in Figure 1.



**Figure 1 - Bar Half-Bar Print Location  
(Check Design Not Shown)**

NAME	88-1539 / 1119	9012
ADDRESS	042001713	
PAY TO THE	\$	
ORDER OF		
		DOLLARS
BANK NAME		
BANK ADDRESS	..  ..  ..	
MEMO		
81:1119153981: 042001713 9012		

### Figure 2 - Pointer Location Example

Corporate Logo	Corporate Name Corporate Address	88-1539 / 1119 042001713	CHECK NO. 252752
PAY TO THE ORDER OF: NAME OF INDIVIDUAL / COMPANY			\$**366.92
THREE HUNDRED SIXTY - SIX AND 92/100 *****			
BANK NAME / ADDRESS			
			
			
⑈ 252752⑈8⑈111915398⑈ 042001713⑈			

**Figure 3 - Pointer Location Example**  
(Business Size Check Design Not Shown to Scale)



6.2.2 Other Check Design Features

Other features may be within the Bar Half-Bar print zone, such as the signature line and bank identification. When the Bar Half-Bar barcode is utilized in a check design, one should maximize the space around the barcode to improve the reliability of reading the barcode.

6.3 Bar Half-Bar Print Requirements

6.3.1 Barcode Dimensions

The Bar Half-Bar barcode and bracket bars shall have the following requirements for point size, stroke width, and gap.

Full Bar	0.020 inch stroke width	0.080 inch height
Half Bar	0.020 inch stroke width	0.040 inch height
Bracket Bar	0.020 inch stroke width	0.120 inch height
Space (gap)	0.020 inch stroke width	

6.3.2 Dimensional Tolerances

The tolerance of each bar or space shall be ± 0.005 inches and shall be non-cumulative. All measurements shall be made from the right hand edge of the barcode.

6.3.3 Barcode Clear Band

There shall be a minimum of 0.100 inch of clear space surrounding the barcode.

6.3.4 Bar Half-Bar Alignment

The full bars and half-bars of the Bar Half-Bar barcode shall be aligned so that the bottom edge of each bar is on the same baseline. Proper alignment of the full bars and half-bars is shown in Figure 4.



Figure 4 - Bar Half-Bar Alignment

6.3.5 Bracket Bar Alignment

The Bar Half-Bar barcode shall be aligned within the bracket bars so that the bottom edge of each bar is on the same baseline. Proper alignment of the bracket bars is shown in Figure 5.



Figure 5 - Bracket Bar Alignment

### 6.3.6 Bar to Bar Alignment

The vertical alignment of the full bars, half bars and bracket bars shall be within 0.005 inches for the entire length of the barcode.

### 6.3.7 Skew

Skew greater than  $\pm 1.5$  degrees within the individual bars of the barcode is not allowed. The entire barcode shall not have a skew greater than 3 degrees as measured from the leading or aligning edge of the document.

### 6.3.8 Barcode Density

The barcode shall be printed with black ink and shall have a minimum print contrast signal of 0.60. See ANS X9.7, Annex A.

### 6.3.9 Reflectance

The minimum background reflectance value within the barcode clear band shall be 40%. See ANS X9.7, Annex A.

## 6.4 Barcode Data Content

The Bar Half-Bar barcode represents a binary number. It becomes a binary identifier for a RSF application. The full bar represents the binary one and the half bar represents the binary zero. The most significant bit is the left most full bar. Figure 6 contains examples of the correct decoding of the barcode. All twelve bars, plus the two bracket bars, shall be printed. No truncation of the printed barcode shall be allowed.



Figure 6 - Coding and Decoding Examples

## 7 Security Feature Registration

In order to use this standard, a security feature or combination of security features shall be registered and shall use a unique binary identifier. For approval and assignment of a binary identifier for a security feature(s) application, the interested party must contact the X9 committee and provide the information found in Annex A of this Standard. The X9 committee may be contacted at the following address:

X9 Committee Secretariat  
American Standards Committee X9, Inc.  
PO Box 4035  
Annapolis, Maryland 21403 USA

The committee can also be contacted through the following web address.

[www.X9.org](http://www.X9.org)

If needed, an application can be sent to the requestor either by mail or e-mail. The completed application, along with a written request for approval upon company letterhead, shall be mailed to the X9 committee. A fee is also required with the submitted application to help offset additional administrative functions associated with security feature(s) registration.

## Annex A (Normative) Registration of Security Features

### A.1 Security Feature Registration Form

The following information is required for registration of security features.

#### A.1.1 Company Information

Company: _____	Contact: _____
Address: _____	e-mail: _____
_____	
_____	Telephone: _____
Web Site: _____	FAX: _____

#### A.1.2 Security Feature

Describe the security feature, or combination of features, that your company wishes to register.

#### A.1.3 Intellectual Property

Is the security feature protected by a patent(s). If so, list the patent(s) by title and patent number.

#### A.1.4 Field Test

Has the security feature application gone through a field test? If so, provide details on the test.

#### A.1.5 Equipment

Does the security feature application require specialized equipment for detecting the security features? If so, list the equipment required and provide information related to the procurement of the equipment.

#### A.1.6 Mail Form To:

X9 Committee Secretariat  
American Standards Committee X9, Inc.  
PO Box 4035  
Annapolis, Maryland 21403 USA

Be sure to include a letter of request for the registration of the security feature(s) on company letterhead. A fee is required for registration of the security feature(s).

**Annex B**  
(Normative)

**Conversion Table - Inches to Millimeters**

<i>Inches</i>	<i>Millimeters</i>
0.005	0.127
0.020	0.508
0.040	1.016
0.080	2.032
0.100	2.540
0.120	3.048
0.125	3.175
0.500	12.700
0.625	15.875
1.125	28.575
6.000	152.400
8.750	222.250



**Annex C**  
(Informative)  
**NWI- NEW PROJECT PROPOSAL FORM**

**Accredited Standards Committee  
X9 - Financial Services**

**1. GENERAL INFORMATION**

**Date of Submittal:** July 28, 1998  
**Name of Proposer:** E.E. Barnes  
**Organization:** Mars Electronics International  
**Address:** 3266 Limestone Road  
Cochranville, PA 19330  
**Telephone:** 610-593-6454  
**Fax:** 610-593-2736  
**Email:** [eebarnes@epix.net](mailto:eebarnes@epix.net)  
**Project Title:** Indicators of Check Machine Readable Features  
**Project Number:** (Assigned by X9 Secretariat)

**2. JUSTIFICATION OF PROPOSED STANDARD**

**Issue Description:**

Modern replication technology has made it increasingly easy to create identical copies of checks. To the unaided eye, the original and the copies are identical. Use of machine readable security features and their authentication is desirable to remove the human judgment factor for security feature validation. To allow machine authentication requires that a trigger or an indicator be present to indicate that such security features are resident. This will eliminate the ambiguity of knowing if this is a secured item, an unsecured item or one that those cloning checks have not copied. The presence of these security features, if identified, would allow check verification by machine methods. This will have utility from the point of sale and the teller window through the entire check processing system, thereby increasing the security of checks.

**Need/Benefit/Audience:**

Each member of the check using community can profit from the presence of these security features. Retail sales through check processors can profit from the ability to determine that security features are present, thereby allowing utilization of increased level of security.

**3. COORDINATION WITH OTHER STANDARDS**

**Do you see this as a guideline or a standard?**

This must be a standard to be effective in reducing check fraud.

**Could this standard become part of another X9 standard?**

Probably not.

**Should this project be developed within ISO/TC68 as an international standard?**

No, not as of this time.

**List any closely related domestic standards either published or under development of which you are aware.**

X9.51 Document Fraud Deterrent Standard.

**Describe any related domestic work efforts.**

None is known as of this time.

**List any closely related international standards either published or under development of which you are aware.**

None

**Describe any related international work effort.**

None known as of this time.

**Security - Related Needs:**

Data security is not an issue. The item under test carries its own security features.

#### **4. PROJECT TIMELINE AND PARTICIPATION**

**Estimated Project Development Time:**

Estimates indicate standard development cycle for X9B working group.

**Potential Participants:**

BancTec  
Bank of America  
Clarke American  
Clearwave Electronics  
Chase  
CreateACheck  
Deluxe  
Harland  
Heath Custom Press  
IBM  
Liberty Check  
Mars Electronics  
McBee  
NCR  
New York Clearing House  
Paychex  
Standard Register  
Source Technologies  
RDM  
Unisys  
Xerox

#### **5. MARKETING INFORMATION**

**What is the target audience for this guideline or standard?**

Vendors who will provide the hardware and software for such systems as well as those who design or produce checks will be the major customers. Merchants and banks will also need this standard.

**What industry need will the standard or guideline fill and how?**

Anyone who is using checks from the retailer to those who use high-speed processing will find the potential of this verification procedure useful.

**How will X9 "sell" the standard or promulgate its use?**

X9, the American Banker Association, the Federal Reserve Banks, and industry groups will promote the use of this means of increasing security for the financial institutions and the user community.

**Description for Letter Ballot**

TO: Darlene Schubert  
FROM: Barney Barnes  
DATE: July 30, 1998

SUBJ: X9B recommends the approval of this New Work Item for Indicators of Check Machine Readable Security Features.

Modern replication technology has made it easy to create copies of checks which appear identical to the original. Machine readable security features are available which can not be easily copied. Use of machine readable security features and their authentication is desirable to remove human judgment from the validation of these security features. To allow use of machine detection of these features requires that a trigger or indicator be present to indicate that such features are resident. This is needed to eliminate the ambiguity as to if this is a secured item, an unsecured item or one that those cloning checks have not copied, thereby permitting machine verification. Such machine verification will have utility from the point of sale and teller through the entire check processing system.