

American National  
Standard  
for Financial Services

**X9/TG-8-2002**

**CHECK SECURITY  
GUIDELINE**

Secretariat:  
**Accredited Standards Committee X9, Inc.**

Approved September, 2001  
by X9 Committee

## FOREWORD

This technical guideline is a product of the Accredited Standards Committee X9 Financial Services, and was generated by the ASC X9B Checks Subcommittee. It is the result of a cooperative effort of Bankers, Check Printers, Equipment Manufacturers, and Paper Suppliers; and as such, is the first compilation of techniques for the reduction of check fraud encompassing the entire "life cycle of the check." The guidelines referred to in this publication are compatible with existing check standards and practices. Recommendations are based upon current and forecasted aspects of both technological and banking practices.

These guidelines, while extensive in scope, do not cover all possible techniques or preventative measures. While there are no guarantees that these techniques or measures will prevent fraudulent uses of checks, they do provide the reader with the basics necessary to ascertain their vulnerability to check fraud.

The revision of the X9/TG-8 Check Security Technical Guideline has been undertaken to ensure that TG-8 remains current, in response to the experiences and needs in the US Payments System. Mr. Rick Youngblood of Bank of America (Charlotte) initially led the X9B11 Work Group for this revision. Rick also headed the Mid-Atlantic Check Fraud Task Force and ensured that the Work Group members had timely information to consider. As work continued, Ms. Helene Kontonis of the Chase Manhattan Bank succeeded Mr. Youngblood as X9B11 Work Group Chair. Helene, with the help of the Work Group members, has accomplished the necessary revisions and additions to this valuable publication. Final revisions for publication were completed by Mr. Curt Siroky, X9B Vice Chairman, John H Harland Company. At the time of its approval, the X9 Committee had the following members:

Harold G. Deal, X9 Chairman, BB&T  
Vincent DeSantis X9 Vice Chairman, New York Clearing House  
Cynthia L. Fuller, Managing Director, X9  
Darlene J. Schubert, Program Manager, X9

The X9 committee had the following members:

Organization .....	Representative
ACI Worldwide .....	Cindy Rink
ACI Worldwide .....	Jim Shaffer
American Bankers Association.....	Stephen Schutze
American Bankers Association.....	Michael Scully
American Bankers Association.....	Don Rhodes
American Express Company .....	Mike Jones
American Express Company .....	Barbara Wakefield
American Express Company .....	Dick Schreiber
American Express Company .....	Gerry Smith
BancTec, Inc.....	Christopher Dowdell
BancTec, Inc.....	David Hunt
Bank of America .....	Daniel Welch
Bank of America .....	Mack Hicks
Bank of America .....	Richard Phillips
Bank One Corporation .....	Jacqueline Pagan
BB and T .....	Harold G. Deal
Caradas .....	Rick (Richard P.) Kastner

Caradas .....	John Gould
Caradas .....	Tom Johnston
Certicom Corporation.....	Daniel Brown
Certicom Corporation.....	Brenda Klein
Check Solutions .....	Ron Schultz
Check Solutions .....	Jerry Bowman
Check Solutions .....	Harry Hankla
Check Solutions .....	Don Harman
Citigroup, Inc.....	Daniel Schutzer
Citigroup, Inc.....	Mark Scott
Citigroup, Inc.....	Skip Zehnder
Compaq Computer Corporation.....	Larry Hines
Compaq Computer Corporation.....	Gary Lefkowitz
Datum, Inc.....	Sandra Lambert
Datum, Inc.....	John Bernardi
Datum, Inc.....	Jerry Willett
Deluxe Corporation.....	Maury Jansen
Diebold, Inc.....	Judy Edwards
Diebold, Inc.....	Bruce Chapa
Discover Financial Services.....	Patsie Rinchiuso
Discover Financial Services.....	Masood Mirza
Discover Financial Services.....	Pamela Ellington
eFunds Corporation.....	Cory Surges
eFunds Corporation.....	Chuck Bram
eFunds Corporation.....	Forrest Martin
eFunds Corporation.....	Joseph Stein
eFunds Corporation.....	Daniel Rick
eFunds Corporation.....	Richard Fird
Federal Reserve Bank.....	Dexter Holt
Federal Reserve Bank.....	Gary Chaulklin
Federal Reserve Bank.....	Jeannine M. DeLano
Federal Reserve Bank.....	Laura Walker
First Data Corporation.....	Gene Kathol
Food Marketing Institute.....	Stacy Fitzgerald-Redd
Food Marketing Institute.....	Ted Mason
Griffin Consulting.....	Phil Griffin
Griffin Consulting.....	Harriette Griffin
J.P. Morgan Chase and Co.....	Robert Blair
J.P. Morgan Chase and Co.....	Richard Yen
KPMG LLP .....	Jeff Stapleton
KPMG LLP .....	Al Van Ranst
Mag-Tek, Inc. ....	Carlos Morales
Mag-Tek, Inc. ....	Jeff Duncan
Mag-Tek, Inc. ....	Mimi Hart
Mag-Tek, Inc. ....	Terry Benson
MasterCard International.....	Ron Karlin
MasterCard International.....	Naiyre Foster

MasterCard International.....	Caroline Dionisio
Mellon Bank, N.A.....	David Taddeo
Mellon Bank, N.A.....	Richard H. Adams
Merrill Lynch.....	Jennifer Smith
Merrill Lynch.....	Dave Yeger
National Association of Convenience Stores .....	Robert Swanson
National Association of Convenience Stores .....	Teri Richman
National Association of Convenience Stores .....	John Hervey
National Security Agency .....	Gregory Bergren
National Security Agency .....	Sheila Brand
NCR Corporation.....	David Norris
NCR Corporation.....	Steve Stevens
New York Clearing House .....	Vincent DeSantis
New York Clearing House .....	John Dunn
Niteo Partners .....	Michael Versace
Silas Technologies.....	Andrew Garner
Silas Technologies.....	Ray Gatland
SPYRUS .....	Karen Randall
SPYRUS .....	James Randall
SPYRUS .....	Walt Boland
Star Systems, Inc.....	Elizabeth Lynn
Star Systems, Inc.....	Michael Wade
Unisys Corporation .....	Navnit Shah
Unisys Corporation .....	David J. Concannon
VeriFone, Inc. ....	John Sheets
VeriFone, Inc. ....	Brad McGuinness
VeriFone, Inc. ....	Brenda Watlington
VISA International.....	Patricia Greenhalgh
Wells Fargo Bank .....	Terry Leahy
Wells Fargo Bank .....	Ruven Schwartz

The X9B Committee had the following members:

- Mr. Christopher Dowdell, Chairman, BancTec, Inc.
- Mr. Curt Siroky, Vice Chairman, John H Harland Company
- Mr. Daniel Welch, Vice Chairman, Bank of America

Organization .....	Representative
ACOM Solutions .....	Carl Grant
ACOM Solutions .....	Neela Patel
Advanced Financial Solutions.....	Mark Craig
Advanced Financial Solutions.....	Stephen Gibson-Saxty
American Bankers Association.....	Stephen Schutze
American Express Company .....	Dick Schreiber
American Express Company .....	Mike Jones
BancTec, Inc.....	Christopher Dowdell

BancTec, Inc.....	David Hunt
Bank of America .....	Thomas Marko
Bank of America .....	Daniel Welch
Bank One Corporation .....	Jacqueline Pagan
BB and T .....	Harold G. Deal
Boise Cascade Paper.....	Jim Moore
Check Solutions .....	Ron Schultz
Check Solutions .....	Jerry Bowman
Check Solutions .....	Harry Hankla
Check Solutions .....	Don Harman
Check Technology Corporation.....	Peter Wood
Check Technology Corporation.....	Terry Strong
CheckTech.....	Jan Wood
CheckTech.....	Dan Wood
Chicago Clearing House Association.....	Dewayne Baker
Citigroup, Inc.....	Daniel Schutzer
Clarke American Checks, Inc.....	John W. McCleary
Clarke American Checks, Inc.....	Clifton Conner
ClearWave Electronics.....	Mark Ross
ClearWave Electronics.....	Tia Lazor
Comerica .....	Beverly A. Bercaw
Comerica .....	Dennis Minor
Create-A-Check, Inc. ....	John Hays
Create-A-Check, Inc. ....	Jared Kesler
Deluxe Corporation.....	Maury Jansen
Deluxe Corporation.....	Juan Celorio
Diebold, Inc.....	Bruce Chapa
Diebold, Inc.....	Laura Drozda
Discover Financial Services.....	Masood Mirza
Discover Financial Services.....	Pamela Ellington
ECCHO.....	Phyllis Meyerson
Federal Reserve Bank.....	Jeannine M. DeLano
First Data Corporation.....	Gene Kathol
Food Marketing Institute.....	Stacy Fitzgerald-Redd
Food Marketing Institute.....	Ted Mason
Griffin Consulting.....	Phil Griffin
Griffin Consulting.....	Harriette Griffin
J.P. Morgan Chase and Co.....	Joe Nelson
J.P. Morgan Chase and Co.....	Ron Warner
J.P. Morgan Chase and Co.....	Robert Blair
J.P. Morgan Chase and Co.....	Richard Yen
John H Harland Company .....	Curt Siroky
Liberty Enterprises, Inc.....	Richard Pliml
Mag-Tek, Inc. ....	Carlos Morales
Mag-Tek, Inc. ....	Jeff Duncan
Mellon Bank, N.A.....	David Schaper
Mellon Bank, N.A.....	Dave Leach

Merrill Lynch .....	Harry Mahlstedt
Moore Business Forms Inc .....	Larry McCartney
National Security Agency .....	Gregory Bergren
National Security Agency .....	Sheila Brand
NACHA The Electronic Payments Association .....	Nancy Grant
National Organization of Clearing Houses.....	Ian Macoy
NCR Corporation.....	David Norris
NCR Corporation.....	Steve Stevens
NCR Corporation.....	Wayne Doran
NCR Corporation.....	Hui Wu
New England Business Service.....	Barry Green
New York Clearing House .....	Henry Farrar
New York Clearing House .....	Susan Long
New York Clearing House .....	John Dunn
Nu-Kote International.....	Tice McCarthy
Oce Printing Systems .....	Tony Ribeiro
Oce Printing Systems .....	Leon Dietz
Paychex Inc .....	Carl Tinch
RDM Corporation.....	Peter Hanna
Relizon.....	Ellen Carter
Relizon.....	Mel Stephenson
Relyco Sales Inc .....	Michael Steinberg
Reynolds and Reynolds Co. ....	Mark Hoenie
Reynolds and Reynolds Co. ....	Steve Kuhn
Rosetta Technologies .....	Jim Maher
Rosetta Technologies .....	Paul Malinowski
Silas Technologies.....	Andrew Garner
Silas Technologies.....	Ray Gatland
SICPA Industries of America.....	Thomas Jay
Source Technologies Inc .....	Mike Bailey
Source Technologies Inc .....	Wally Burlingham
Standard Register Company .....	Melissa Barnes
Standard Register Company .....	Russell Hill
Star Systems, Inc.....	Michael Wade
Sun Trust Service Corporation .....	Daniel Stephens
Troy Systems International, Inc.....	Greg Kussmann
Troy Systems International, Inc.....	Mark Whitson
Unisys Corporation .....	Leonard Wasielewski
Unisys Corporation .....	Navnit Shah
Unisys Corporation .....	David J. Concannon
Wachovia Operational Services Corporation .....	Keith Ross
Xerox Corporation .....	Frank Bov
Xerox Corporation .....	Luch Corso
Xerox Corporation .....	Robin Ringo
Zions Bancorporation .....	Pamela Wallis

## TABLE OF CONTENTS

FOREWORD.....	i
TABLE OF CONTENTS.....	vi
1. INTRODUCTION.....	1
1.1 PURPOSE AND SCOPE.....	1
1.2 REFERENCES.....	1
2. LIFE CYCLE OF A CHECK.....	2
3. CHECK PRINTERS AND CHECK STOCK RETAILERS.....	5
3.1 CHECK PRINTERS.....	5
3.1.1 ACCESS.....	5
3.1.2 ADMINISTRATION.....	6
3.1.3 SALES PRACTICES.....	6
3.1.4 SUPPLIES.....	6
3.1.5 PRINTING.....	6
3.1.6 FACILITIES.....	7
3.1.7 EMPLOYEES.....	7
3.2 CHECK STOCK RETAILERS.....	7
3.2.1 ACCESS.....	7
4. CHECKS, DRAFTS AND MONEY ORDERS.....	8
4.1 BANK DRAFTS.....	8
4.2 CASHIER'S CHECKS AND OFFICIAL CHECKS.....	8
4.3 CERTIFIED CHECKS.....	8
4.4 DEMAND DRAFTS.....	9
4.5 MONEY ORDERS.....	9
4.6 PAYABLE-THROUGH-DRAFTS.....	9
4.7 TRAVELER'S CHECKS.....	9
4.8 TREASURY CHECKS.....	9
4.9 WARRANTS.....	10
4.10 PRE-AUTHORIZED DRAFTS.....	10
5. TYPES OF CHECK FRAUD.....	10
5.1 ALTERATION.....	11
5.2 FORGERY.....	11
5.3 COUNTERFEIT.....	12
5.4 "BAD" CHECKS.....	12
5.5 CHECK KITING.....	12
5.6 PRE-AUTHORIZED DRAFTS.....	12
6. MANUAL DETECTION.....	13
6.1 ALTERATION DETECTION.....	13
6.1.1 ALTERATIONS OF DOLLAR AMOUNTS.....	13
6.2 FORGERY DETECTION.....	13
6.2.1 HANDWRITTEN CHECKS.....	14
6.2.2 PRINTED INFORMATION.....	14
6.2.3 TYPEWRITTEN CHECKS.....	14
6.2.4 AUTHORIZED SIGNERS ON BUSINESS ACCOUNT.....	14
6.3 COUNTERFEIT DETECTION.....	15
6.4 CHARACTERISTICS AND DETECTION OF CHECK KITING.....	16
7. PHYSICAL CHECK SECURITY FEATURES.....	16
7.1 PROTECTION TECHNIQUES.....	16
7.2 PAPER FEATURES.....	17
7.2.1 CHEMICAL TAGGANT.....	17

7.2.2	CHEMICAL TAGGANT SECURITY THREAD.....	17
7.2.3	CHEMICAL SENSITIVITY.....	17
7.2.4	FIBERS.....	17
7.2.5	PLANCHETTES.....	17
7.2.6	SAFETY TINT.....	17
7.2.7	SECURITY THREAD.....	18
7.2.8	TONER ADHESION ENHANCEMENT.....	18
7.2.9	WATERMARK (GENUINE).....	18
7.3	DESIGN FEATURES.....	18
7.3.1	ACCOUNT NUMBER VERIFICATION.....	18
7.3.2	“AMOUNT IN WORDS” LEGAL AMOUNT FIELD.....	19
7.3.3	BACKGROUND PATTERN.....	19
7.3.4	DECORATIVE BORDER.....	19
7.3.5	EMBEDDED DATA.....	19
7.3.6	MICROPRINT.....	20
7.3.7	PORTRAITURE.....	20
7.3.8	SECURITY SCREEN.....	20
7.3.9	SPLIT FOUNTAIN.....	20
7.3.10	VOID EMBLEMS.....	20
7.3.11	VOID PANTOGRAPH.....	20
7.4	PRINTING FEATURES.....	20
7.4.1	CHEMICAL TAGGANT.....	20
7.4.2	COLORED INK.....	21
7.4.3	FLUORESCENT INK.....	21
7.4.4	INTAGLIO PRINTING (STEEL-DIE ENGRAVING).....	21
7.4.5	MACHINE READABLE UV FLUORESCENT/ PHOSPHORESCENT INKS.....	21
7.4.6	MACHINE READABLE INFRARED INKS.....	21
7.4.7	MAGNETIC INK.....	21
7.4.8	METALLIC INK.....	21
7.4.9	OPTICALLY VARIABLE INK.....	22
7.4.10	PENETRATING INVISIBLE FLUORESCENT.....	22
7.4.11	PENETRATING NUMBERING INKS.....	22
7.4.12	PHOSPHORESCENT INK.....	22
7.4.13	PHOTOCHROMIC INKS.....	22
7.4.14	VARNISH.....	22
7.4.15	WATERMARK (ARTIFICIAL).....	22
7.5	REACTIVE INKS.....	22
7.5.1	BLACK TO RED BLEEDING INK.....	22
7.5.2	BLEACH REACTIVE INK.....	23
7.5.3	ERASABLE INKS.....	23
7.5.4	IRREVERSIBLE HEAT REACTIVE INKS.....	23
7.5.5	MULTI-FUGITIVE INKS/WATER AND SOLVENT REACTIVE.....	23
7.5.6	RUB/SCRATCH SENSITIVE INK.....	23
7.5.7	SOLVENT/CHEMICAL FUGITIVE (CHEMICALLY SENSITIVE) INKS.....	23
7.5.8	THERMOCHROMIC INKS.....	23
7.5.9	WATER FUGITIVE/WATER SOLUBLE INKS.....	23
7.6	OTHER FEATURES.....	24
7.6.1	ALPHANUMERIC CONVENIENCE AMOUNT PRINTING (POSITIVE OR REVERSE).....	24
7.6.2	CARBONLESS OVERPRINT.....	24
7.6.3	CHECK DIGIT VALIDATION.....	24
7.6.4	EMBOSSMENT.....	24
7.6.5	FOIL STAMPING.....	24
7.6.6	HOLOGRAM.....	25

7.6.7	KINEGRAM .....	25
7.6.8	MICROPRINT CODE .....	25
7.6.9	PIXELGRAM.....	25
7.6.10	DOCUMENT FRAUD DETERRENT ICON .....	25
7.7	ALTERED OR COUNTERFEITED FEATURE APPEARANCE.....	27
7.8	SECURITY FEATURE MATRIX SUMMARY.....	28
8.	CUSTOMER.....	33
8.1	CUSTOMER SECURITY PROCEDURES .....	33
8.1.1	SELECT A GOOD CHECK DESIGN.....	33
8.1.2	INSTALL RECONCILIATION PROCEDURES.....	33
8.1.3	ENROLL IN A "POSITIVE PAY" PROGRAM.....	33
8.1.4	DESTROY OLD DOCUMENTS.....	34
8.1.5	KEEP DUTIES SEPARATE.....	34
8.1.6	TIGHTEN PROCEDURES.....	34
8.1.7	RECONCILE STATEMENTS PROMPTLY .....	34
8.1.8	PERFORM AUDITS.....	34
8.1.9	DEFINE CHECK SECURITY CODES .....	34
8.1.10	KEEP ACCOUNTS SEPARATE.....	34
8.1.11	GUARD AGAINST STOLEN CHECKS .....	34
8.1.12	SECURE THE CHECK SUPPLY .....	35
8.2	CUSTOMER (AS CHECK PRINTER) SECURITY PROCEDURES .....	35
8.2.1	PROTECT THE CHECK PRINTING ENVIRONMENT .....	35
8.2.2	SECURE BLANK CHECK STOCK.....	35
9.	PAYEE.....	35
9.1	ACCEPTING CHECKS AS PAYMENT .....	35
9.1.1	INSUFFICIENT FUNDS .....	36
9.1.2	STOLEN CHECKS.....	38
9.1.3	COUNTERFEIT CHECKS.....	38
10.	FINANCIAL INSTITUTIONS.....	39
10.1	FINANCIAL INSTITUTIONS.....	39
10.2	COLLECTING BANK.....	40
10.3	PAYOR BANK.....	40
10.4	ACCESS .....	40
10.5	NEW ACCOUNTS.....	40
10.5.1	NEW ACCOUNT SIGNATURE .....	41
10.5.2	NEW ACCOUNT CHECKS.....	41
10.5.3	NEW ACCOUNT IDENTIFICATION PROCEDURES.....	41
10.5.4	NEW ACCOUNT VERIFICATION PROCEDURES.....	41
10.6	CHECK PRINTERS.....	43
10.6.1	SECURITY SCREENING CHECKLIST .....	43
10.7	TRASH.....	44
10.8	CHARGE CARD CHECKS.....	44
10.9	SIGNATURE VERIFICATION.....	44
10.9.1	OPERATIONS.....	45
10.9.2	TELLERS .....	45
10.9.3	RETURNS .....	45
11.	LOSS REPORTING CATEGORIES.....	45
11.1	CHECK RELATED LOSS CATEGORIES .....	46
12.	LAW ENFORCEMENT.....	47
12.1	ISSUING.....	47
12.2	PROCESSING.....	47
13.	EDUCATION.....	47
13.1	ACCESS.....	48

13.1.1	INFORMATION: ACCOUNT NUMBER .....	48
13.1.2	INVENTORY: CHECKS .....	48
13.1.3	PROCEDURES: AUDITORS .....	48
13.1.4	EQUIPMENT: PRINTERS .....	48
13.1.5	EMPLOYEES: TRAINING .....	48
13.1.6	CUSTOMERS: PARTNERSHIPS .....	49
13.1.7	SERVICES: CASHING CHECKS .....	49
13.1.8	ACCOUNTS PAYABLE: USING CHECKS .....	49
13.2	PREVENTION AND DETECTION .....	49
14.	IN-STORE BANKING .....	51
15.	ON-LINE BANKING .....	51
15.1	ATMs .....	51
15.2	INTERNET WEB SITES .....	51
APPENDIX A .....		52
APPENDIX B .....		54
APPENDIX C .....		56
APPENDIX D .....		57
APPENDIX E .....		58
APPENDIX F .....		59
FIGURE 1 - PAPER LIFE CYCLE OF A CHECK .....		3
FIGURE 2 - PAPER LIFE CYCLE OF A TRUNCATED CHECK .....		4
FIGURE 3 - ACCOUNT NUMBER VERIFICATION EXAMPLE .....		18
FIGURE 4 - STYLIZED MICROPRINT DESIGNATOR .....		19
FIGURE 5 - LOCK ICONS .....		25
FIGURE 6 - TYPICAL CHECK WITH LOCK ICON .....		25
FIGURE 7 - WARNING BOX SAMPLE .....		26
TABLE 1 - DETECTION METHODS AND RESULTING APPEARANCE OF DOCUMENT FRAUD .....		27 - 28
TABLE 2 - SECURITY FEATURE MATRIX SUMMARY .....		29 - 32

## 1.0 INTRODUCTION

Since the late 1980's, increases in losses due to the fraudulent use of checks have grown dramatically. The guidelines in this document are the *latest* effort by the industry to identify the elements of fraud and fraud prevention tools. Although fraud losses have grown dramatically, the vast majority of checks (over 99%) are good and pass through the payment system without incident or error. No other payment method is as flexible, functional, or as widespread.

## 1.1 PURPOSE AND SCOPE

The purpose of this guideline is to provide those who participate in the paper document processing system, namely financial institutions, check vendors and merchants, with the information they need to educate their employees and customers about fraud, and to identify and implement the fraud prevention programs appropriate for their business. It is with the idea of maintaining and even improving the efficiency of the check payment system that we ask all check acceptors to assess their risk of loss due to fraud and take prudent measures to reduce that risk without unduly inconveniencing or alienating honest customers, or compromising legitimate dealings with suppliers and creditors.

NOTE: For the purposes of this guideline, the term "bank" is used interchangeably with "financial institution" and carries the same meaning as that contained in Regulation CC, Section 229.2(e), and includes, but is not limited to: commercial banks, savings banks, thrifts, credit unions.

## 1.2 REFERENCES

The Accredited Standards Committee X9 Financial Services is charged with establishing and maintaining guidelines and standards for the Financial Industry. These guidelines and standards are then approved and published by the American National Standards Institute (ANSI). When the standards referenced in this document have been superseded by a revision approved by the American National Standards Institute, the revision shall apply. The applicable American National Standards and revision dates at the time of publication of this guideline are:

ANS X9.7-1999	Specifications for Bank Check Background and Convenience Amount Field
ANS X9.13-1999	Specifications for Placement and Location of MICR Printing
ANS X9.18-1998	Paper Specifications for Checks
ANS X9.27-2000	Print and Test Specifications for Magnetic Ink Character Recognition (MICR)
ANS X9.29-1998	Check Carrier Envelope Specification
ANS X9.40-1998	Check Correction Strip Specification
ANS X9.51-1998	Fraud Deterrent Icon Standard
ANS X9.53-1996	Specifications for Check Endorsements
X9/TG-2-1995	Understanding and Designing Checks
X9/TG-6-2000	Quality Control of MICR Documents

Within the text of this guideline, specifications are shown in an abbreviated form, for example, "ANS X9.7".