ASA
Reg. U. S. Pat. Off.
X3.4-1963
UDC 681.3 (Tentative)

→ Superceded by X3.4-1965

American Standard Code for Information Interchange

Sponsor

Business Equipment Manufacturers Association

Approved June 17, 1963

AMERICAN STANDARDS ASSOCIATION
INCORPORATED

American Standard

Registered United States Patent Office

An American Standard implies a consensus of those substantially concerned with its scope and provisions. An American Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American Standard does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American Standards are subject to periodic review and users are cautioned to obtain the latest editions. Producers of goods made in conformity with an American Standard are encouraged to state on their own responsibility in advertising, promotion material, or on tags or labels, that the goods are produced in conformity with particular American Standards.

Published by

AMERICAN STANDARDS ASSOCIATION
INCORPORATED
10 East 40th Street, New York 16. N. Y.

Universal Decimal Classification 681.3 (Tentative)

Printed in USA

D10M763/1

Foreword

(This Foreword is not a part of American Standard Code for Information Interchange, X3.4-1963.)

This American Standard presents the standard coded character set to be used for information interchange among information processing systems, communication systems, and associated equipment.

Subsequent standards will prescribe the means of implementing this standard in the principal media, such as perforated tape, punched cards, and magnetic tape. Other standards will deal with collating and error control considerations. These standards will facilitate the interchange of digital information.

The 7-bit coded character set was developed by a group of highly qualified and experienced specialists in information processing and communication.* Past work in the field was reviewed, and a comprehensive program of original research and code design completed. Careful consideration has been given to the several conflicting code set requirements, and their resolution achieved in the standard code.

This standard was approved as American Standard by the American Standards Association on June 17, 1963.

Suggestions for improvement gained in the use of this standard will be welcome. They should be sent to the American Standards Association, Incorporated, 10 East 40th Street, New York 16, N. Y.

The ASA Sectional Committee on Computers and Information Processing, X3, which developed this standard, had the following personnel at the time of approval:

C. A. PHILLIPS, *Chairman* R. E. UTMAN, *Secretary*

Air Transport Association of America	F. C. WHITE
American Bankers Association	G. W. FREY
American Gas Association and Edison Electric Institute (jointly)	R. E. HARBAUGH
American Management Association	G. N. STILIAN
American Petroleum Institute	F. A. GITZENDANNER
Association for Computing Machinery	SAUL GORN
Association of Consulting Management Engineers	LANSDALE BOARDMAN
Business Equipment Manufacturers Association	F. W. BAUER W. H. BURKHART R. F. CLIPPINGER G. T. CROFT R. W. GREEN R. J. MINDLIN B. W. POLLARD C. E. SHINN A. H. STILLMAN
Data Processing Management Association	J. M. ADAMS
Electronic Industries Association	H. L. THOLSTRUP
Engineers Joint Council	W. M. CARLSON
General Services Administration	R. A. RAUP
The Institute of Electrical and Electronics Engineers	R. W. FERGUSON G. W. PATTERSON
Insurance Accounting and Statistical Association	CARL ORKILD
Joint Users Group	H. N. CANTRELL
Life Office Management Association	EUGENE BOULANGER
National Retail Merchants Association	ETHEL LANGTRY
Telephone Group	L. W. CLAUSSEN
U. S. Department of Defense	G. L. BOWLBY

* Operating under ASA Project X3, Computers and Information Processing. The Business Equipment Manufacturers Association serves as sponsor of the X3 project.

At the time the proposal was developed and processed through ASA X3.2 subcommittee, the subcommittee membership was as follows:

C. E. Macon, *Chairman*
Burroughs Corporation

I. Liggett, *Former Chairman*
International Business Machines Corporation

R. E. Utman, *Secretary*
Sperry Rand Corporation

J. F. Auwaerter
Teletype Corporation

J. E. Bartelt
IBM Corporation

L. Bloom
National Cash Register Company

R. E. Blue
IBM Corporation

T. H. Bonn
Sperry Rand Corporation

J. B. Booth
Teletype Corporation

T. R. Bousquet
Minneapolis-Honeywell Regulator Company

J. F. Chesterman
Bell Telephone Laboratories

L. L. Griffin
U. S. Department of Defense

R. Gryb
American Telephone & Telegraph Corporation

H. Kleinberg
Radio Corporation of America

W. J. Leubbert
U.S. Military Academy

M. Pivovonsky
Monroe Calculating Machine Company

R. W. Reach
Minneapolis-Honeywell Regulator Company

H. J. Smith, Jr
IBM Corporation

H. Tholstrup
Friden, Inc

A. J. Ungar
International Electric Corporation

A. L. Whitman
Bell Telephone Laboratories

It should be recognized that although X3.2 members are variously affiliated, work on an ASA subcommittee is achieved primarily on an individual competence and experience basis. The membership above has with some exceptions been continuously active from the beginning of X3.2 work in 1960.

Contents

Section		Page
1.	Scope	5
2.	Standard Code	5
3.	Positional Order and Notation	5
4.	Legend	5
5.	Qualifications	6
Appendixes		
Appendix A	Design Considerations for the Coded Character Set	7
Appendix B	Related Subsets and Adaptations	9
Appendix C	Specific Criteria	10

American Standard Code for
Information Interchange

1. Scope

This coded character set is to be used for the general interchange of information among information processing systems, communication systems, and associated equipment.

2. Standard Code

b_7				0	0	0	0	1	1	1	1
b_6				0	0	1	1	0	0	1	1
b_5				0	1	0	1	0	1	0	1
b_4	b_3	b_2	b_1								
0	0	0	0	NULL	DC_0	b	0	@	P		
0	0	0	1	SOM	DC_1	!	1	A	Q		
0	0	1	0	EOA	DC_2	"	2	B	R		
0	0	1	1	EOM	DC_3	#	3	C	S		
0	1	0	0	EOT	DC_4 (STOP)	$	4	D	T		
0	1	0	1	WRU	ERR	%	5	E	U		
0	1	1	0	RU	SYNC	&	6	F	V		
0	1	1	1	BELL	LEM	' (APOS)	7	G	W		
1	0	0	0	FE_0	S_0	(	8	H	X		
1	0	0	1	HT / SK	S_1	)	9	I	Y		
1	0	1	0	LF	S_2	*	:	J	Z		
1	0	1	1	V_{TAB}	S_3	+	;	K	[		
1	1	0	0	FF	S_4	, (COMMA)	<	L	\		ACK
1	1	0	1	CR	S_5	−	=	M	]		(1)
1	1	1	0	SO	S_6	.	>	N	↑		ESC
1	1	1	1	SI	S_7	/	?	O	←		DEL

UNASSIGNED

UNASSIGNED

3. Positional Order and Notation

Standard 7-bit set code positional order and notation are shown below with b_7 the high-order, and b_1 the low-order, bit position.

	b_7	b_6	b_5	b_4	b_3	b_2	b_1
EXAMPLE: The code for "R" is:	1	0	1	0	0	1	0

4. Legend

NULL	Null/Idle	DC_1-DC_3	Device control
SOM	Start of message	DC_4(Stop)	Device control (stop)
EOA	End of address	ERR	Error

Legend continued on following page

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.