BELL TELEPHONE LABORATORIES
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SUBJECT: Proposed Revised (1966) ASCII - X3 Action

DATE: JUL 25 1966

FROM: D. A. Kerr

ENGINEER'S NOTES

On June 30, 1966, ASA Sectional Committee X3 authorized the immediate issuance of a 30-day final letter ballot on the Proposed Revised (1966) American Standard Code for Information Interchange. The proposal at this point is exactly as was balloted by subcommittee X3.2, with the exception of a few minor changes made by X3. These changes, which will be explained below in detail, are:

1. The code table representation of overline will now be ‾ rather than ⌐ .

2. Position 2/3, number sign (#), will carry a note indicating that the pound sterling sign (£) is recognized alternative.

3. Appendix B1.2, which recognizes the need for minor deviation from the standard, is amplified.

Figure 1, attached, shows the latest code table.

The following is a brief review of the events immediately preceding X3's action.

On July 1, an X3.2 letter ballot was issued on the proposed revision. As the close of ballot drew near (de jure this was July 2; de facto it was July 29, the date of the X3.2 meeting) it appeared that there were two critical issues which could provoke no or abstain votes.

First, ECMA (European Computer Manufacturer's Association - a strong voice in the international arena), reviewing the results of the April ISO/CCITT meeting, were disturbed over the "compromise" which left # and £ cohabiting the same code table position (2/3). The same conflicts of criteria which originally spawned the "compromise" still prevented the emergence of any tangible proposals for reform. We understand, however, that many of the ECMA members felt that perhaps the issue should somehow be reopened, and that they should strive to have # excised entirely from the international code, it being left to those countries needing it (U.S. mainly, UK and USSR somewhat) to site it in a national usage position.

Concerned that this continued controversy might foreshadow
rupture of the international agreement achieved at Paris,
UNIVAC indicated that they would decline to cast an X3.2 ballot
on the proposed revision.

At the X3.2 meeting series, I exhorted the UNIVAC representative
to ballot in the affirmative, stating that defeat of the
proposal could in no way assure recovery of international
concord even should his fears be realized. He did vote
"yes" at the X3.2 meeting.

X3.2 ratified a Task Group X3.2.4 resolution reaffirming
the U.S. feeling that # must remain with some status in
position 2/3. This resolution was placed in the hands of
John Auwaerter, the X3.2 international representative,
for informal transmittal to interested parties in Europe.

Second, SHARE and GUIDE (associations of users of IBM computers),
supporting a position of the group standardizing the PL/I
program language*, registered a complaint that the proposed
revision did not move the symbols | and ⌐ to the central 4
columns of the code table.

The PL/I people wished to use these graphics as the representa-
tion for logical or and negation, respectively, and wanted these
in the portion of the code table which would be most widely
implemented in I/O devices. A similar objection was raised
when, in 1965, the two symbols were first placed in the code.
At the time it was pointed out that no relocation of the symbols
could be made consistent with other more immutable requirements.
IBM at the time indicated that, this being the case, they would
adopt ! and ^ as the representations for or and negation.

In the July ballot on pR(1966) ASCII, however, IBM "... in
support of our users ..." voted no.

An extensive discussion was held on the issue at the X3.2.4 and
X3.2 meetings, resulting in a reaffirmation of our 1965 findings.
We pointed out to the SHARE/GUIDE people that the preference for
certain graphics as conventions for logical operators is a very
temporal matter. A formal rejection of the IBM position was
prepared on this basis.

At the X3. meeting, the SHARE/GUIDE/IBM axis again made their
plea, but found even less enthusiasm for any change. Many
of the X3 members are program language experts of very long
tenure, and could hardly believe that program development would
suffer if a new standard language had to use ^ for negation.

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* At the last meeting of this group, several members were seen
   supporting buttons reading: "Would you believe - PL/II?"

Eventually, the SHARE/GUIDE people said they would yield to this view, but asked if we could avoid giving the symbol overline the shape ⌐ in our code table. They said that this so strongly implied negation that it would impede the introduction of the new (⌃) convention.

X3 concurred, and it was agreed that the symbol ⌐ be shown instead, consistent with a similar suggestion in the ISO agreement, based upon the recognized use of the <u>overline</u> as <u>tilde</u>.

(I had made this proposal in May to X3.2.4, who accepted it; X3.2, however, overturned this decision on the assumption that the PL/I people would somehow retain the use of this character for negation.)

X3 further restored a change to an appendix which had been introduced by X3.2.4 but was rejected by X3.2. The new wording clarified the status of codes "consonant with though not conforming to" the standard. This served to further assure the programming interests that we were sympathetic with some of their extreme needs.

The inclusion of "£" as an alternate symbol for "#" was done at the behest of a number of manufacturers, who expressed a desire to be able to manufacture a single configuration of input or output device for both U.S. and foreign sales. Since the number sign is so little used even here, and the pound sterling (£) so vital abroad, they said that they would like the privilege of providing £ instead of # on universal (U.S./export) equipment. This is clearly another manifestation of the impact of international standards upon domestic manufacturers, and it demonstrates that concern with U.S.-international standards compatibility need not grow only from altruistic roots.

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HO-3142-DAK-MG
Att.
Figure I

FIGURE 1

PROPOSED REVISED (1966)
ASCII

7/1/66

Row ↓ \ Column →	0 000	1 001	2 010	3 011	4 100	5 101	6 110	7 111
0	NUL	DLE	SP	0	@ ①	P	`	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	"	2	B	R	b	r
3	ETX	DC3	# ①	3	C	S	c	s
4	EOT	DC4	$	4	D	T	d	t
5	ENQ	NAK	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
10	LF	SUB	*	:	J	Z	j	z
11	VT	ESC	+	;	K	[	k	{
12	FF	FS	,	<	L	\	l	|
13	CR	GS	-	=	M	]	m	}
14	SO	RS	.	>	N	^	n	~
15	SI	US	/	?	O	_	o	DEL

Bits: b₄ b₃ b₂ b₁ (Row), b₇ b₆ b₅ (Column)

① or £