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THE ENGLISH ELECTRIC CO., LTD.

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Front sheet.
Data sheets 1. and 2.
Figure sheets S6/10516.

DEUCE Subroutine No. 149 (R13)

Report by
R.A.E.

SUMMARY.

The attached document contains details of a DEUCE Subroutine which has been prepared and tested by R.A.E.

MATHEMATICAL PHYSICS LABORATORY.

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Description. Reads single or double-length numbers punched on a card in any layout, and converts them to binary. The layout is controlled by a parameter. Another parameter determines whether the sign is in the same column as the first decimal digit, or in the column before that.

Method. While the card is being read the digits on it are converted to straight binary coded decimal in the four minor cycles of QS 18. Digits in $18_{3,0,1,2}$ have weights 1, 2, 4, 8 respectively. The rest of the conversion is done after the card has been read.

Data. Hollerith cards punched in decimal.

Result. Each time the routine is entered one number is converted to binary. New cards are read when required, i.e. on the first entry to the routine a card is read, and the left-hand number on it converted to binary. On subsequent entries the remaining numbers are converted. When all the numbers have been converted the next entry will cause a further card to be read.

Instructions for use.

Stores Used.	13	14	15	18	19	20	21
Contents at Entry.	Link	-	-	-	-	-	-
Contents at Exit.	-	-	-	-	-	-	a

Occupies. D.L.2. D.L.$3_{2,\ 6-31}$.

Entry. 2_{18}.

Constants. 0 21-0, 1, 1 in 3_{18}
0 21-0, 1, 1 in 3_{23}.

Waste Instruction. 2, 0-0, 0, 1 in 3_{31}.

Time. $1\frac{1}{2}$ n + 2d + 3 m.s. plus the time taken between the 1st and last single-shots. n is the number of entries and of numbers converted d= No. of decimal digits + spaces + signs.

Parameters. The timing number in 2_7 is zero if the first decimal digit of each number is in the same column as its sign. It is 8 if the sign is in the column before this.
The layout parameter in 3_{13} has zero in those positions corresponding to spaces and the last decimal digit of each number. It has ones in those positions corresponding to the positions of the remaining decimal digits, and signs, on the card to be read. No spaces are allowed before the first number.

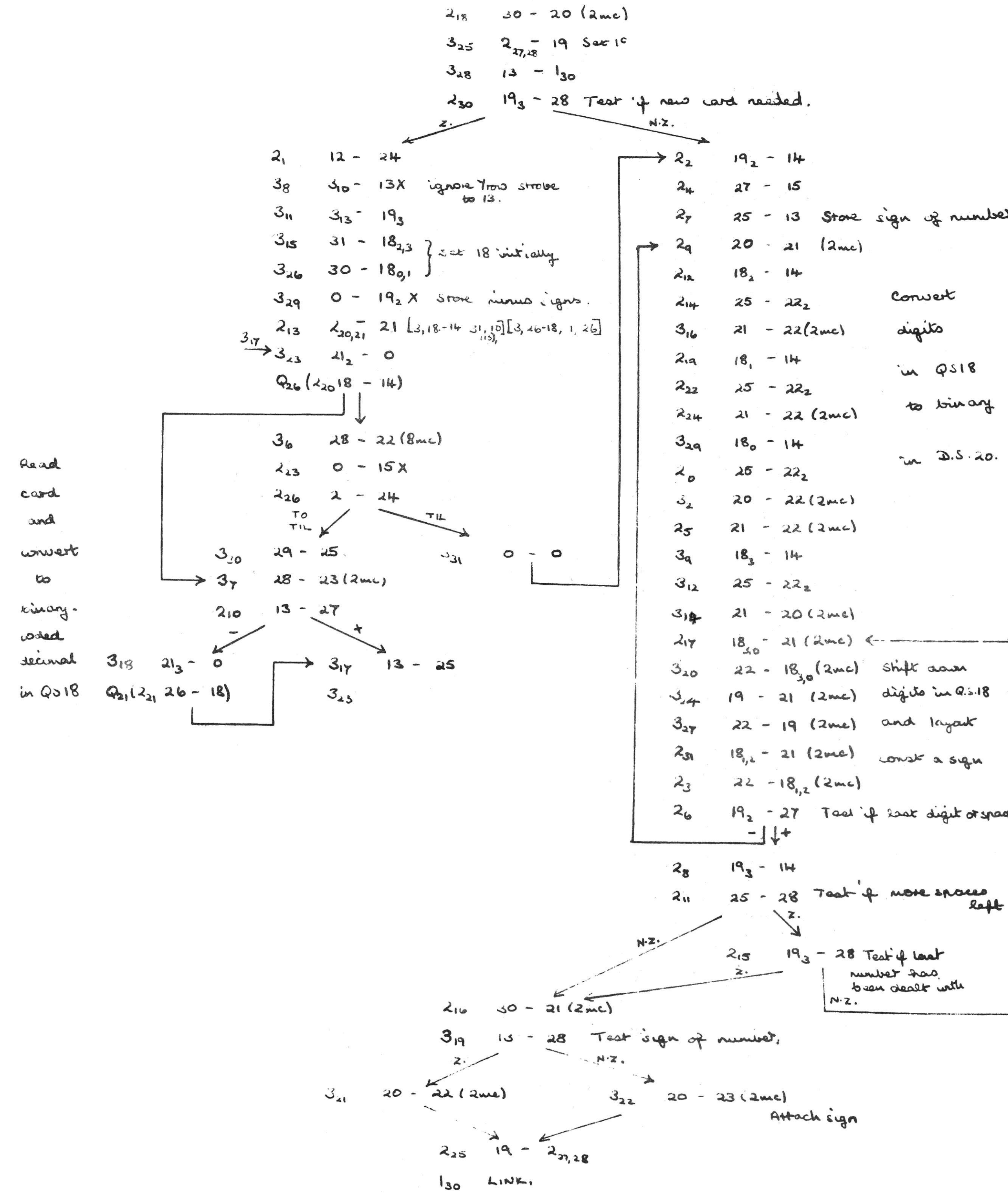
Clear Read. There is no clear read instruction in this subroutine. If the cards are to be read one at a time the waste instruction in 3_{31} may be used for this purpose.

Otherwise the read can be cleared in the main routine. The maximum time allowed between the last single-shot of one card and the first single shot of the next card is 80 major cycles. If the total time taken by this subroutine (as given above) plus the time taken in the master routine between the various entries to this subroutine excedes that amount, the reader must be stopped between cards. In this case the reader must be stopped within 40 major cycles of the last single-shot of the card.

N.B. QS 18 is used to store the decimal digits read on the card and must not be disturbed until all the numbers read from a card have been converted. $2_{27,28}$ are used similarly, but in addition 2_{27} being zero is used as a sign that a new card should be read so this must never be disturbed. However it can be zeroised to indicate that the remainder of the last card read is to be ignored, and a new card read when the subroutine is next entered.

June, 1956. R.A.E.

D.L. 2. Track								D.L. 3. Track								
Card Nos. 1, 2, 3.								Card Nos. 4, 5, 6.								
mc	NIS	S	D	C	W	T		mc	NIS	S	D	C	W	T		
																Y
																X
																0
																1
0	3	25	22		0	0		0								2
1	3	12	24		0	5		1								3
2	2	19	14		0	0		2	2	20	22	2	0	1		4
3	2	22	18	2	0	1		3								5
4	2	27	15		0	1		4								6
5	3	21	22	2	1	2		5								7
6	2	19	27		0	0		6	2	28	22	1	8	15		8
7	2	25	13		0	0		7	2	28	23	2	0	1		9
8	2	19	14		1	1		8	3	3	13		0	1	X	Y
9	2	20	21	2	0	1		9	3	18	14		0	1		X
10	3	13	27		0	5		10		31, 19, 27,	26,	5,	0,	1.		0
11	2	25	28		0	2		11	3	3	19		0	2		1
12	2	18	14		0	0		12	3	25	22		0	0		2
13	3	2	21	2	5	8		13		Layout Parameter.						3
14	3	25	22		0	0		14	2	21	20	2	0	1		4
15	2	19	28		0	31		15	3	31	18	2	1	7		5
16	3	30	21	2	0	1		16	2	21	22	2	0	1		6
17	3	18	21	2	0	1		17	3	13	25		0	4		7
18	3	30	20	2	0	5		18	0	21	0		1	1		8
19	2	18	14		0	1		19	3	13	28		0	0		9
20	3	18	14		31	(15) 10		20	3	22	18	2	1	2		Y
21	3	26	18		1	26		21	2	20	22	2	1	2		X
22	2	25	22		0	0		22	2	20	23	2	0	1		0
23	2	0	15		0	1	X	23	0	21	0		1	1		1
24	3	21	22	2	0	3		24	3	19	21	2	0	1		2
25	1	19	2	2	0	3		25	3	2	19	2	0	1		3
26	3	2	24		0	2		26	2	30	18	2	0	1		4
27			Store					27	2	22	19	2	0	2		5
28			Store					28	2	13	1		0	0		6
29	2	0	19		1	14	X	29	2	18	14		1	1		7
30	2	19	28		1	1		30	3	29	25		0	7		8
31	2	18	21	2	0	2		31	2	0	0		0	1		9



Date
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FLOW DIAGRAM AND CODING FOR DEUCE SUBROUTINE NO 149 (R13). Several Decimal Read.

NELSON RESEARCH LABORATORIES, THE ENGLISH ELECTRIC CO. LTD., STAFFORD, ENGLAND.