Z501/1

THE ENGLISH ELECTRIC CO., LTD.

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Report by M.A. Kingsbury.

DEUCE Subroutine No. 171 (R02/1).

Front Sheet.
Data Sheets 1 - 2.
Figure Sheet S6/10627.

SUMMARY.

The attached document contains details of a DEUCE Subroutine which has been prepared and tested by N.R.L., Blackheath Lane.

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HEF

Description. The subroutine reads two signed 9-digit decimal numbers from a card, converts them to binary and multiplies them by a given scaling factor. i.e. it converts from a specified number of decimal places to a specified number of binary places.

First Order.

Data. 'a' and 'b' two signed 9-digit decimal numbers with D decimal places punched, the signs punched in cols. 1 and 11, and the decimal punching in cols. 1 and 11, and the decimal punching in cols. 2-10 and 12-20 respectively.

Useful Scaling Factors.

D	p	$10^{-D}\ 2^{p+30}$
		P_{31}
0	0	
1	4	6, 19, 25, 12, 6, 19, 1
2	7	31, 8, 1, 23,30, 8, 1
3	10	12, 26, 13, 18,24, 0, 1
4	14	12, 29, 2, 23,13, 20, 1
5	17	4, 17, 21, 5,30, 9, 1
6	20	3, 20, 23, 23,17, 1, 1
7	24	11, 19, 18, 31,21, 21, 1
8	27	9, 28, 14, 12,30, 10, 1
9	30	1, 29, 11, 16,11, 2, 1
10	34	7, 27, 31, 6,31, 22, 1

Result. 'a' and 'b' to p binary places in 19_2 and 19_3 respect.

Failures. 9-24X if card is not decimally punched.

Error. $\pm \frac{1}{2}$ P.1.

Time $2\frac{2}{3}$ ms before Y 1000 single shot
12 ms (max) after 9 1000

Instructions for Use.

Stores Used.	13	14	15	16	19_2	19_3	20_2	20_3
Contents at Entry.	Link	-	-	-	-	-	-	-
Contents at Exit.	Kb	-	-	$10^{-D}\ 2^{p+30}$	Ka	Kb		-

Stores Used.	21_2	21_3
Contents at Entry.	-	-
Contents at Exit.	zero	zero

Occupies. D.L.'s 2, 3_{0-26}.

Entry. 2_{11}

Parameter. $K.10^{-D}2^{30}$ in 3_{17} ($K = 2^p$ to produce a,b and c to p binary places).
N.I.S. and T of failure instruction as required.

Constants available. P_6 in 3_6
$P_{1,\ 21-32}$ in Z20.
$P_{2-10,\ 12-21}$ in 2_{25}.

Waste Instructions available. 3, 0-0, 3, 2 in 3_9.

Note: There is no clear read in this subroutine. The waste instruction in 3_9 may be used for this purpose if required.

D.L. 2 Track Card Nos.							D.L. 3 Track Card Nos.							
mc	NIS	S D	C	W	T		mc	NIS	S D	C	W	T		
														Y
														X
														0
														1
0	3	14 22		0	3		0	3	12 24		0	0		2
1	3	21 13		0	15		1	2	0 22		1	10	X	3
2	3	21 20	2	0	16		2	2	30 20		1	31		4
3	3	30 21	2	0	28		3	2	20 15		1	25		5
4	3	19 14		0	9		4	2	3 13		0	0		6
5	2	30 19		0	0		5	3	2 24		0	0		7
6	2	29 14		0	0		6		P_{16}					8
7	3	2 22		0	2		7	3	26 14		0	3		9
8	2	25 25		0	0		8	2	2 22		10	12		Y
9	0	0 8 26	9	26	2		9	3	0 0		3	2		X
10	2	23 14		0	0		10	3	19 22		0	4		0
11	3	13 1		17	19		11	3	0 24		0	28		1
12	2	13 27		0	0		12	3	14 20		0	0		2
13	3	0 19		1	27	X	13	3	21 22	1	1	4		3
14	2	13 25		0	0		14	3	27 15		0	20		4
15	2	19 22		0	0		15	3	3 16		0	8		5
16	2	13 16		0	0		16	2	2 15		7	12		6
17	2	21 16		0	0		17		$10^{-D} \times 2^{P+30}$					7
18	2	16 25	1	1	4		18	3	19 21		1	1		8
19	2	20 21		0	0		19	3	21 23		1	1		9
20		$P_{1,21-32}$					20	2	20 23	1	8	11		Y
21	2	16 20		0	0		21	3	19 28		0	0		X
22	2	21 28		0	3		22	2	25 28		0	9		0
23	3	25 28		0	10		23	1	13 19		0	5		1
24	2	25 25		0	0		24	3	13 19		0	0		2
25		P_{2-20}					25	2	27 15		0	12		3
26	2	13 25		0	1		26	2	23 14	1	0	9		4
27	2	20 19		0	7		27							5
28	2	9 24		0	30		28							6
29	2	13 16		0	0		29							7
30	2	0 14		0	0	X	30							8
31	2	16 25	1	2	5		31							9